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ECONOMIC AFFAIRS

No. 964

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ECONOMIC POLICY, ORGANIZATION AND MANAGEMENT

MANAGERS SEEK INTENSIFIED PRODUCTION

Moscow IZVESTIYA AKADEMII NAUK SSSR-SERIYA EKONOMICHESKAYA in Russian No 1, Jan-Feb 81 pp 5-18

[Article by L. M. Alyabina and V. N. Kashin: "Improving the Economic Mechanism--The Path Toward Production Intensification"]

[Text] The article is devoted to urgent problems relating to the functioning and improvement of the socialist economic mechanism in light of the decisions of the 24th and 25th CPSU congresses and the subsequent decrees of the CPSU Central Committee and the USSR Council of Ministers. It is emphasized that at the present stage, intensive economic development factors have moved to the forefront. Precisely from this viewpoint the authors have examined the questions of implementing the party and government decisions in the area of improving the economic mechanism and in particular planning, the organizational structure of production and management, developing the principles of cost accounting, introducing social development programs at the enterprises and associations and so forth.

The fulfillment of the quotas of the Tenth Five-Year Plan have provided new confirmation of the advantages of the economic system of developed socialism. The focus on end results and on creating conditions for the all-round development of all members of society and the planned use of resources have made it possible for the Soviet economy to ensure a high level of satisfying the material and cultural needs of the people. Thus, with an amount of national income equaling 67 percent of the U.S. national income, the Soviet Union in 1979 noticeably surpassed the United States in the production in a number of major products not only in heavy industry but also in light and food industries, including: sugar, milk, vegetable oil, for the fish catch and the production of marine products, the production of leather footwear, woolen and cotton textiles on a per capita basis. The USSR builds approximately the same amount of apartments as the United States. All of this, undoubtedly, shows the more efficient use of national income in our country and the orientation of its production potential on achieving high end results.

At the same time, many reserves of economic growth and increasing national prosperity are still not fully used.

The improving of the economic mechanism in a direction pointed out in the decisions of the Communist Party and the Soviet government serves as the main condition for further increasing the efficiency of social production and realizing intensive economic growth factors. The improving of the mechanism and methods of socialist management has served and does serve as an important factor in the continuous growth of the USSR economy.

After the victory of the October revolution, V. I. Lenin advanced as the prime task "the turning of the entire state economic mechanism into a single large machine, into an economic organism which operates so that hundreds of millions of people are directed by a single plan...."[1] The 24th and 25th CPSU congresses made a substantial contribution to [illegible] theoretical generalization of the problem of improving the economic mechanism. At the 25th CPSU Congress, this problem was for the first time made into an independent one in the system of national economic management.[2]

At the present stage the main economic and social task which determines the future development of the nation consists in consistently carrying out a course of *"a continuous rise in the material and cultural standard of living of the people, the creation of better conditions for the all-round development of the individual on a basis of a further rise in the effectiveness of all social production, and an increase in labor productivity and the growth of the social and labor activeness of the Soviet people."*[3] A maximum realization of the intensive economic development factors is essential for successfully carrying out the designated task. Greater intensification requires by the planning and economic bodies a constant search for the most rational means to achieve high end results, the elaboration of large-scale problems and modern scientific and technical ideas as well as their rapid introduction into production.

The Decree of the CPSU Central Committee "On Further Improving the Economic Mechanism and the Tasks of the Party and State Bodies" and the Decree of the CPSU Central Committee and USSR Council of Ministers "On Improving Planning and Strengthening the Effect of the Economic Mechanism on Raising Production Efficiency and Work Quality" approved on 12 July 1979 were aimed at solving the timely problems of economic development and a rise in the level of its management.

On the question of improving planning work, an important role has been given to measures aimed at increasing the scientific soundness of the plans. The five-year plan is becoming the chief form of planning the nation's economic and social development and the basis for organizing the economic activities, the enterprises, associations and ministries. The plan will be worked out within the framework of the long-range 10-year period and on the basis of the 20-year comprehensive program for scientific and technical progress. The further development of the unified and integrated system of plans will help to ensure planning continuity. The presence of stable 5-year quotas and long-range economic standards substantially alters the role of annual planning. The stable long-term economic standards are a new phenomenon in planning practices. Among them is the wage standard or rate per ruble of product, and for the industrial ministries there is the rate for profit deductions to be left to the disposal of the ministries for capital construction, for replenishing working capital and for forming the unified scientific and technical development fund and the rates for forming the economic incentive funds.

Under present-day planning conditions, the enterprises and associations are interested in setting taut annual plans as the approving of a lax plan inevitably leads to a decline in the employee wage fund, the material incentive fund, the fund for sociocultural measures and housing construction and so forth. The approved planning system makes it possible to approach the elaboration of the annual plan from below, starting with the associations and enterprises. This raises the role of the counterplans, it strengthens the importance of the socialist competition, it broadens the horizon for the creative initiative of the workers and thereby mobilizes them to achieve high economic growth rates.

In the system of measures provided in the decree of the CPSU Central Committee and USSR Council of Ministers of 12 July 1979, a most important place is held by specific program planning. During the 11th Five-Year Plan, specific integrated programs will become a most important component part in the long-range economic development plans. The specific comprehensive program in a long-range plan operates as an instrument which coordinates the efforts of various executors and this is one of the most difficult tasks in planning practices. For precisely this reason emphasis is put on the directive and address nature of the specific programs and the necessary end result of each of them is clearly indicated. In the immediate future there are plans to work out specific integrated programs for saving fuel and metal, for developing the zone of the BAM [Baykal-Amur Mainline], for reducing the use of manual labor and for increasing consumer goods production.

One of the most essential areas for improving planning is to ensure a high level of plan balancing. The latter is becoming the most important lever for increasing the efficient functioning of the economy and all elements of the economic mechanism. The balancing of the plans is a guarantee for the normal activities of enterprises and organizations in the area of marketing and supply and for the functioning of the system of economic levers and incentives. It is a guarantee for the ubiquitous achieving of a normal social level for the intensity of the production process. It is a question not of a formal equilibrium between the components of the economy but rather the ubiquitous use of progressive standards and rates which ensure a continuous growth of production efficiency.

The designated decree of the CPSU Central Committee and the USSR Council of Ministers notes the need to improve the responsibility of the USSR Gosplan and the USSR ministries and departments for balancing the quotas in the state plan. The interests of achieving economic balance bring to the forefront the problem of economic growth rates and proportions. It is essential that stable economic growth rates at present should be achieved not only by the setting of them from above but also, and this is important, by developing creative initiative from below.

Analysis indicates that economic development is largely achieved on a basis of the traditional sectors and production methods. To a definite degree this impedes the development rate of the new, progressive sectors and the introduction of progressive production methods. For this reason it is so important to have the elaboration of correct priorities in the development of the sectors and economic regions, orienting them to achieve high end results, a fuller satisfying of social needs and the meeting of the requirements of scientific and technical progress. For improving the national economic structure and for steadily increasing the efficiency of social production, it is essential to provide, on a basis of the greatest possible introduction of the achievements of the scientific and technical revolution, a more rapid development of those vitally important elements as power, transportation, the fuel industry, ferrous and nonferrous metallurgy, machine building and chemistry.

A solution to the question of the stability of financial plans and plan quotas represents a major step on the path toward economic balancing. According to the new regulation, the ministries and departments are obliged to issue the plans to the associations, enterprises and organizations not later than 6 weeks prior to the start of the planned year and provide stability for the approved annual and quarterly plans. The relative stability of the financial plans with a change in prices or with the appearance of new product types can also become an important condition for achieving balance.

Substantial changes have been incorporated in the procedure for planning the investment process. This concerns primarily the elaboration and approval of a stable 5-year capital construction plan with a breakdown of the quotas by year. The plan should be balanced with the material, financial and labor resources and also brought into accord with the capability of the construction and installation organizations. Until recently there were almost annual revisions of the capital construction plan. Some projects were mothballed and the construction times of others were extended. This led to a significant increase in the average time of construction, to a freezing of a significant portion of capital investments, to the delayed completion of important national economic projects and to the extensive utilization of accumulation. According to the new regulation, capital investments will be planned once for the five-year plan. The capital investment structure is not to be revised in the annual plans. The achieving of balance and a rise in the effectiveness of the capital investments to a significant degree will be achieved by concentrating the investments on the primary, nearly completed projects and by reducing the number of newly started projects. Such a concentration of resources is one of the essential conditions for intensive economic development.

A revision of the social production proportions is closely tied to ensuring national economic balancing. This revision is aimed at increasing the output of end product from the extracted raw materials. For solving this problem, it is essential, as was pointed out in the Draft of the CPSU Central Committee "Basic Directions in the Economic and Social Development of the USSR for 1981-1985 and for the Period Up to 1990," to consistently carry out a policy of "more rapid technical reequipping of production, the development and production of machinery and equipment making it possible to improve working conditions and raise labor productivity as well as save material resources."[4]

Such renewal of the equipment and production methods should have a comprehensive nature and provide a transition to systems of new generation machines and fundamentally new production processes. The long-term plans for the development of the associations should become a form for the planned management of such a transition. These plans would encompass the entire cycle of renewing the produced product and replacing the fixed productive capital. The decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 notes the inacceptability of setting plan quotas proceeding solely from the existing dynamics of the corresponding indicators. The manufacturing specifications of the enterprises and associations should fully reflect their technical and economic potential. This will make it possible to promptly work out plans for the reconstruction and expansion of production, utilizing all the concealed internal reserves. Constant (and not one-shot) work with the manufacturing specifications of the enterprises and associations can be very effective. As a result of such work, the questions of equipment load factors, production specialization and so forth can be correctly solved. Work in this area has already been done at a number of enterprises. Thus, at many enterprises in Dnepropetrovskaya Oblast they have begun to work out and solve the problems of achieving maximum production volumes through the efficient use of all existing resources by economizing and by reducing unproductive losses. On this basis there has been an improvement in the functions of managing the enterprises and production associations, including: internal plant planning, the forming of the annual production program, the plan for the development of use and production capacity. Optimum variations are being compiled for the set production volumes with definite technical, economic and quality indicators in accord with the planned material, energy, labor and financial resources. In forecasting, together with the product consumers, they determine not only the prospects for a rise in the product technical level but also the ways for improving production methods.

The achieving of balance in social production to a significant degree is related to the problem of improving the production ties and, in particular, to carrying out contractual obligations relating to product deliveries.

The fulfillment of product deliveries in terms of the set range, assortment and quality shows the degree of satisfying social demand. For this reason under present-day planning conditions, the role of the delivery indicator has significantly risen. Enterprise operations are judged considering the fulfillment of the contract which should concretize the plan quotas and ensure rational economic ties for the enterprise.

The decree of the CPSU Central Committee and USSR Council of Ministers of 12 July 1979 points out: "The production associations (enterprises) and organizations in their annual plans should be given a range (assortment) of products to be produced according to customer orders in accord with the concluded contracts."[5]

For example, the following fact shows the importance of carrying out a contract. According to the data of the USSR TsSU [Central Statistical Administration], over the 8 months of 1980, some two-thirds of the associations of the Minstankoprom [Ministry of Machine Tool and Tool Building Industry] did not meet the quotas for product deliveries in accord with the concluded contracts and issued orders. As a result the consumers did not receive from them 95 million rubles worth of ordered metalworking equipment and other products. At the same time a large portion of these associations and enterprises overfulfilled the quotas for the production volume and product sales.

A contract in and of itself is not an instrument capable of eliminating all the flaws in a plan, nevertheless it is necessary to raise the question of the equal liability of all the contractual partners. To a significant degree this task is carried out by setting 5-year and annual quotas for the volume of deliveries needed to carry out the production plan, by working out a balance of material resources and plans for their allocation, by guaranteed complete supply on the basis of contracts with the Gossnab bodies and by the changeover to centralized deliveries with approval from the transport systems. Also of great significance is the decision in 1980 to convert the production associations to direct long-term economic ties.

The soundness and thoroughness of working out a five-year plan depends largely upon the number of indicators to be approved. At the present stage, the primary indicators are those which are oriented at improving production efficiency, such as: the growth of labor productivity, a reduction in material intensiveness, an increase in the return on investment, an improvement in product quality, an acceleration of the asset turnover rate and the development of new products and new capacity. In this regard N. A. Tikhonov has commented: "...We still cannot be satisfied with the achieved efficiency level of social production, labor productivity or the state of affairs in the quality of the produced product. As is known society can distribute only what has been produced and for this reason the questions of the fuller utilization of intensive growth factors, reserves for production, savings and thriftiness remain our central task."[6]

The following example shows that this task is difficult but feasible. At the enterprises in Dnepropetrovskaya Oblast each shop, section, department and brigade is engaged in planning. The basis of it is progressive standards and rates and such indicators as the growth rate of normed net product, the growth of labor productivity, total profit, profitability, the saving of raw products, materials, fuel and electric power, the use factor for production capacity and so forth. The internal plant quality certification for parts, assembly units and production processes is carried out considering the indicators for reducing labor intensiveness and for saving raw products and materials. And the results: at the Dnepropetrovsk Metallurgical Equipment Plant labor productivity over the 4 years has increased by 24 percent while the use level for metal-cutting, forging-stamping and assembly-welding equipment has increased from 79-84 to 94-96 percent. At the Dneproshina [Dnepr Tire] Association, the entire increase in the production volume for a number of years has been obtained due to the rise in labor productivity.[7]

According to the decree, labor productivity is the most important fund-forming indicator which is calculated for normed net product. The latter indicator more accurately measures the true contribution of the collective at the given enterprise or association to producing the product which is the result of the activities of many collectives. This indirectly encourages the output of relatively less material-intensive products, since the net product rate is higher the lower the share of material expenditures in the wholesale price. In the Minenergomash [Ministry of Power Machine Building] the enterprises of which use an indicator of normed net product, the expenditures of raw products and materials in 1977-1978 declined from 31.8 to 29.4 kopecks per ruble of commodity product, although as a whole for industry there has been a tendency for their growth.[8]

The labor productivity indicator is also closely tied to another indicator, product quality. During the 5 years, the collectives of many industrial enterprises, in carrying out the decisions of the 25th CPSU Congress, have searched fruitfully for new integrated forms and methods of production management which would provide more effective operations and high end results. A start was made by the L'vov system for product quality control based on enterprise standards. At present more than 15,000 enterprises have completed the preliminary work and have introduced this system. The results have been very substantial. During the last 5 years, the production volume of superior quality industrial product has risen by 2-fold in the nation.[9] According to the data of the USSR Gosstandard [State Standardization Committee], on 1 September 1980, the state Quality Mark had been awarded to 84,917 types of products produced by 9,357 enterprises. There was a significant reduction in losses from rejects and complaints and the time for developing and introducing new types of products was shortened. In Dnepropetrovskaya Oblast, all the enterprises which have converted to the comprehensive system of product quality control and efficient resource utilization overfulfilled the quotas for the 4 years of the five-year plan in terms of the growth rate of labor productivity and production growth.

The USSR Goskomtsen [State Committee for Prices] has carried out extensive work to improve the system of wholesale prices and rates. Particular attention has been given to elaborating wholesale prices which include surcharges for improved product quality. At present, around 160 price lists and individual parts of them have been worked out and approved. This includes virtually all price lists for heavy industry products as well as for the sectors which consume agricultural raw materials. Work has been done on revising the price lists for machine building and light industry products. It must be emphasized that the system of setting surcharges for quality will have a real effect only with strict control over the observance of all the production processes.

The demand to consider product quality in the wholesale prices for the product is essential but not the only one in the system of wholesale price revision. Two trends can be noticed in the economy over the time which has passed since the last wholesale price revision (1967). In the sectors of the manufacturing industry, on a basis of an acceleration of scientific and technical progress and the growth of labor productivity, there has been a decline in production outlays and, respectively, wholesale prices. During these years the total amount of the price reduction in the manufacturing industry was around 30 billion rubles. In the extracting sectors, the opposite trend has been observed as a consequence of the shift of the basic volumes of the extraction of raw products and fuel into the northern regions of the nation as well as due to the significant (up to 2-5-fold) increase in extracting expenditures in the previously developed regions there has been an increase crease in the one-shot expenditures and product costs. Thus, expenditures to produce a ton of oil in the Tyumen' Region exceed the average wholesale price for oil by 6-fold.[10] In revising the wholesale prices, certainly consideration will be given to other expenditures, for example, to environmental conservation, and these are not materialized in the product but are socially necessary.

As is known, production intensification is manifested in the saving of resources per unit of end product, that is, in a reduction in the labor, capital, material and natural intensiveness of national income. On this level the price operates as the most important instrument for comparing the resource expenditures and the end results of production on a scale of the entire national economy and which is characterized by the different quality and heterogeneity of the product. Thus, prices are an instrument for measuring intensification.

A solution to the problem of the all-round intensification of production can be achieved only in the instance that each production cell and each collective will be armed with criteria for a national economic assessment and by rates for the used resources and produced products, that is, with a tool for comparing expenditures and results.

The dynamics of intensification to a significant degree depend upon the coordinating of its objectives with the interests of the enterprise collectives and reinforcement with a system of material and moral incentives. In this regard prices play a significant role as with their aid the work results of self-financing enterprises are calculated, the amounts of incentive funds are determined and the wage fund is formed.

At present great attention must be given to an economically sound assessment of the scarcest primary resources--labor and natural. There must be the maximum full assessment of the socially necessary labor expenditures on the reproduction of the labor and natural resources and the reflecting of these expenditures in the cost and prices of the product produced with the consumed resources.

Expenditures on the reproduction of the labor force are recovered both in the form of wages as well as payments from the public consumption funds. The rates for payments and benefits like wages, should be differentiated for the sectors, regions and employee categories. To a certain degree this will encourage effective mechanization of labor-intensive processes, particularly with bad working conditions and to some degree restrain the placement of labor-intensive production in regions with high expenditures on the reproduction of the labor force. The carrying out of a number of measures related to the reflecting of expenditures on the reproduction of natural resources in costs and prices to a significant degree will strengthen control over the effective use of the funds allocated for the reproduction of natural resources and will create better conditions for saving natural raw materials, for their integrated processing and the use of secondary resources.

The approach to working out the system of new wholesale prices and setting their level was made precisely from these positions. The new wholesale prices more fully reflect the socially necessary expenditures and more consider the consumer value and effectiveness of the product. Thus, prices for fuel and industrial raw materials have been brought into accord with the expenditures on geological prospecting and their extraction. The wholesale prices also consider the increased rates for state social security (to ensure fuller compensation of expenditures on the reproduction of labor resources), the payment for water, the interest rate (increased in a number of sectors) and so forth and the significant rise in the stump tax to pay for reforestation work.

Wholesale prices will be oriented at increasing the profitability of highly efficient products and increasing their useful effect both for the producers and for the consumers. For example, in particular, according to the instructions approved by the USSR Goskomtsen and the USSR Gosstandart on the procedure for the coordinated elaboration, approval and introduction of technical-norm specifications and prices for machine building products, it is provided that in putting the product into series production, the members of the acceptance commission (representatives of the client must be a member without fail) at the same time examine and sign the information card for calculating economic efficiency and the prices for the new product. Such a procedure accelerates the time for approving the prices, it considers the interests and raises the responsibility of both the manufacturer and the consumer for the decisions taken.

The formation and strengthening of production associations as the basic cost accounting unit are an important area for improving the economic mechanism and strengthening the implementation of intensive factors for the development of social production. The practice of creating and operating the associations during the Ninth and Tenth Five-Year Plans has shown that the progressiveness of the organizational management structures is basically predetermined by the degree of their conformity to scientific-technical progress and to the level of production concentration, specialization, cooperation and integration. At the 25th CPSU Congress it was pointed out that "associations are a qualitatively new phenomenon in managing industrial production. They represent not a mechanical unification of enterprises but rather a unified production and economic complex which organically brings together science and production and widely develops specialization and cooperation."[11]

A particular feature in the formation of the associations is that they have arisen on the basis of not simply production but rather scientific-production complexes in which, along with the conditions for optimum production concentration and specialization, opportunities are created for the concentration and specialization of scientific, design, engineering and experimental work which determines the development prospects of the economic unit. The range of activities for an association, as the basic cost accounting unit, is significantly broader than an individual enterprise running from the making up of the assortment production program and its scientific and technical preparations to the introduction of the produced product at the consumers. Production specialization and concentration at the present stage operate as most important areas for using the organizational resources of economic growth. "Insufficient concentration and separation," as was pointed out at the 25th CPSU Congress, "have led to unjustified outlays and losses and have retarded the solving of major national economic problems."[12] At present, the level of concentration required for the efficient use of new equipment is achieved only in certain types of production, basically mass production with extended and stable product output. The significant scattering of products which are analogous in terms of functional purpose, irrational excessive product range and short production runs as well as the predominant functioning of enterprises with complete-product type of production--all of this creates significant difficulties for the effective introduction of highly productive equipment. Under the conditions of an insufficient level of concentration, the use of this equipment for many enterprises is economically disadvantageous.

Many fundamental problems of production intensification are also linked to the development of specialization. Only on a basis of specialization is it possible to develop modern production methods and ensure qualitatively new growth in the effectiveness of social production and a rise in product quality. However, the small proportional amount of mass production substantially impedes the development of specialization. Thus, series and small-series production in USSR machine building is over 75 percent of the total production volume. According to the data of the USSR TsSU, around 60-70 percent of all machine building products are produced in a series run up to 100 units a year. Under these conditions specialized and automatic equipment cannot be employed with a high degree of efficiency. There is an urgent need to create a comprehensive program for developing specialization in the nation, for working out its indicators on the various levels of national economic management and incorporating them in the system of national economic plans.

The complication of production, the use of modern equipment and automatic lines and the simultaneous interaction of mechanical, hydraulic, pneumatic, electronic and other systems have had a noticeable impact on the organizational and functional structure of management. The experience of the VAZ [Volga Automotive Plant] is interesting in this regard. The association has adopted a precise production structure which is based upon the administrative self-containment of the subdivisions. The process of manufacturing the motor vehicles is concentrated in four large production and product-specialized lines with from 7,000 to 24,000 employees. Shop management has been organized according to a new system. It is carried out by the line personnel. All the functional engineering personnel employed in operational and economic services, in controlling the production processes, repair equipment and material supply have been centralized on the association-wide level and on the line level. Production servicing is based on centralizing the basic types of auxiliary jobs within the lines and for the plant as a whole. The removal of the repair services from the shops has made it possible to create mobile centralized subdivisions to maintain the production, power and transport equipment. All the subdivisions and services of an enterprise are self-financing and bear direct responsibility for the economic indicators of the activities. These activities are carried out with the aid of planning and material incentives.

The decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 outlines a number of measures to develop economic initiative and broaden the rights of the associations and enterprises. In particular, the economic incentive funds (the material incentive fund, the fund for sociocultural measures and housing construction and the production development fund) will be formed using stable rates approved on a differentiated basis for the years of the five-year plan.

Increased rates are set for the enterprises and associations which significantly increase the output of new highly-effective products and new consumer goods. It is important that the balances of the funds are not confiscated and are carried over to the following year.

Under present-day conditions, the planning of new equipment cannot be an isolated or self-sufficient task. At present it is a question of creating an entire plan on the basis of new equipment. In this area certain experience has already been acquired. Thus, the Ministry of Electrical Engineering Industry, in carrying out extensive preparatory work, on 1 January 1980 converted all the enterprises and associations in the sector to new management conditions. At present the entire sector operates under the principle of cost accounting. This has brought tangible results. The introduction of new products into production has significantly accelerated, the economic effect from their use in the national economy during the first quarter of this year rose by 1.6-fold (in 1979, this increase was just 8.9 percent) and the total economic effect from the virtually complete renovation of the product produced in the sector over the last 10 years was around 170 million rubles, or 30 percent of the effect from the production of the entire product of the All-Union Industrial Association Soyuzelektrotyazhmash [All-Union Electrical and Heavy Machine Building]. Four-fifths of the enterprises in the sector were converted to direct long-term economic ties. The sector has been operating for 11 years using the principles for encouraging technical progress described in the decree. During this time the times for introducing scientific and technical achievements into production were shortened by 1.5-2-fold. In 1979, the proportional amount of superior quality products in the volume of certifiable product was 55.9 percent.[13] The organization of the AvtoVAZ [Volga Automotive Plant] Association also affirms the viability and progressiveness of the adopted economic management principles. During the period of starting up and reaching full capacity, the economic incentive funds are formed depending upon the level of fulfilling and overfulfilling the five-year plan for reaching full capacity and for the attaining of designed costs and labor productivity.

It is extremely important to focus all the instruments of the economic mechanism on combating losses in the national economy. In 1979, the Standard Procedure for Calculating Losses and Reserves in the Sphere of Material Production was created. But obviously work in the area of saving manpower, the means and objects of labor and eliminating the irrational use of resources should be carried out more completely and comprehensively.

The formation and use of labor resources under present-day conditions are one of the main problems. The national economy already employs around 92 percent of all the able-bodied population and for many industrially developed regions of the RSFSR, the Ukraine, Belorussia and the Baltic the opportunities to secure workers from the very limited natural increase in the working-age population are constantly declining. The question of the so-called manpower shortage is becoming acute.

At the same time the use of labor at the present stage is not sufficiently efficient. Thus, a significant number of enterprises do not fulfill the plan for th growth of labor productivity and a good share of the increase in industrial product is produced due to extensive factors.[14] The mechanization of manual labor and the elimination of heavy manual labor on the basis of full mechanization and automation are particularly important reserves for raising labor productivity. According to certain calculations, a 10-percent reduction in the share of manual labor in RSFSR industry and construction would mean the freeing of around 2 million persons from unproductive and heavy physical labor. This would also bring about a substantial rise in labor productivity.[15]

Virtually unlimited reserves for raising labor productivity are to be found in the scientific organization of labor [NOT]. In particular, the improving of labor norming on a scientific basis is an effective means for raising productivity. Over the 3 years of the Tenth Five-Year Plan, on a basis of revising the output standards in industry, there was a provisional release of around 1 million persons. In 1978, a decree of the USSR State Committee for Labor and Social Questions was approved on improving labor norming. However, the introduction of correct norming at the enterprises as before is impeded both by the large number of experimental-statistical standards as well as by the insufficient work of systematically revising the standards on a scientific basis.

Management practice provides a number of positive examples of introducing NOT. Indicative of this is the experience of the Shchekino Chemical Combine and this has been introduced at enterprises of a number of sectors. At the enterprises of the chemical industry in 1967-1978 alone, the introduction of the Shchekino method made it possible to release over 70,000 employees and to direct them into new jobs. However, this positive experience which provides a systematic improvement in the use of the intensive production growth factors has not been sufficiently introduced.

One of the major achievements in the area of NOT has been the experiment of the Novosibirsk enterprises to regulate the labor processes on the basis of NOT charts. The essence of the experiment is that the prescribing of the duration and sequence of labor processes is added to the production regulation. Such an integrated designing of the organization of labor makes it possible to sharply reduce the losses of working time and stoppages, to raise product quality, the steadiness of operations, labor discipline and to reduce personnel turnover. The practical use of integrated designs and the changeover to work using the NOT charts made it possible in 1978 alone to provisionally free around 4,000 employees of Novosibirsk industry and obtain an economic effect amounting to 8.5 million rubles. The return on each ruble of expenditure was 2.5 rubles. As a result of improving the organization of labor, at the advanced enterprises labor productivity rose by 10-40 percent.

The experience of the Novosibirsk workers has been adopted by the enterprises of 36 Union sectors and many republic ministries and departments although the rate of its spread has been much more insignificant than one might expect. Each year the number of persons working under the NOT charts increases by 2-3 percent. As is rightly assumed by A. R. Trakhtenberg and B. A. Lysenko, the reasons lie in the serious gap between the regulation and organization of labor. There must not be the emasculation of individual elements of regulation as is still encountered in practice. The designing of the organization of labor requires the elaboration of scientifically based procedural materials and the obligation of employing them.[16]

The technical aspect of the question should be reinforced by the organizational one. In this regard of important significance are the instructions stated in the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 that the brigade or collective form for the organization of labor will be the basic one in the 11th Five-Year Plan. This form has proven completely effective at AvtoVAZ, Uralmash [Urals Heavy Machine Building Plant], at the Kaluga Turbine Plant and other enterprises. Thus, at the Kaluga Turbine Plant the use of the brigade form for the organization of labor, along with other factors, made it possible to sharply reduce personnel turnover. Over the 4 years of the five-year plan, labor productivity rose by 43.6 percent. Already by 1 April of the current year, the association fulfilled the quotas of the five-year plan for the basic technical and economic indicators, including for the indicator of the return on investment. The indisputable advantages of the brigade form have been clearly apparent also at many other enterprises of the various industrial sectors.

Good results have accompanied the use of the normative method of wage planning, that is, the setting of a stable (for the 5-year period) deduction rate for the wage fund from each ruble of finished product. The following data, for example, show this. At the enterprises of the Minkhimmash [Ministry of Chemical and Petroleum Machine Building] in 1975 it required an additional 25 men to increase commodity product by 1 million rubles, but in 1980 only 15. Wage expenditures per ruble of commodity product in 1975 were 23.8 kopecks, and in 1980, 21.5 kopecks. The proportional increase in the production volume due to a rise in labor productivity in 1975 was 79.8 percent and in 1980, 84 percent. Here around one-half of the enterprises of the Minkhimmash in the Tenth Five-Year Plan increased the production volume without increasing the number of employees. The use of the existing capacity and fixed productive capital in the sector exceeds 93 percent.[17]

A very urgent task is the greater flexibility of the rate system and its conformity to the specific production conditions. Here of interest is the experience of AvtoVAZ where, for the purposes of achieving high quality work, surpayments have been introduced for professional skills. They have been set in amounts of 4, 8 and 12 percent of the wage rate for the category assigned to the worker and are paid to the workers in basic and auxiliary production who have achieved high skills in performing their job, who are capable of performing related operations or the jobs of related professions and who are examples of observing production and technical discipline.

Particularly important is the question of creating effective incentives at the enterprises to retain personnel. In particular, practice affirms the effect of surpayments for the number of years worked. For example, after the introduction of surpayments in 1966 in the lumber industry, the turnover factor here in 1972 had declined by almost one-third. In the coal industry, after increasing the surpayments paid to the workers for the number of years worked, the turnover factor declined by approximately 44 percent. The above-listed and certain other measures to a significant degree solved the problem of reducing personnel turnover and lessening the personnel shortage.

Also effective in this area are the social development plans which, according to the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, have become an obligatory component part in the system of plans. The first social development plan was worked out at the Leningrad Svetlana Scientific-Production Association. The initiative of the Leningraders was supported at many enterprises of the nation. Social development plans are now compiled not only in the collectives of industrial enterprises and associations, but also at agricultural enterprises, in transportation, construction, cultural institutions and so forth. At present, social development plans have been worked out at more than 60,000 enterprises and associations. The strengthening of the social orientation in planning has been caused by a number of circumstances. On the one hand, the material opportunities for society to satisfy social needs are growing with a simultaneous rise in the role of the human factor. It must be considered that the rise in the standard of living, education and the culture of people at present is not only and not so much a result of the development of production as a most important prerequisite for its growth and improvement. On the other hand, it is essential to consider the enormous impact of the scientific and technical revolution which has changed the conditions and functions of human activities and has shaped qualitatively new needs and interests for the members of society.

"The high development level of society's productive forces and scientific and technical progress," as N. A. Tikhonov pointed out, "require managerial forms which would make it possible to fully realize the advantages of the planned socialist economy and ensure a significant rise in national economic efficiency."[18]

The basic task of the present stage is to further improve the economic mechanism in accord with the present level in the development of the productive forces and in keeping with the advantages and possibilities of developed socialism. There must be a rise in the efficiency of social production for the purposes of the fullest satisfaction of the needs of society and its every member. In his speech at the October (1980) Plenum of the CPSU Central Committee, Comrade L. I. Brezhnev pointed out that the rise in the standard of living is inconceivable without an increase in economic efficiency and the intensification of all social production. "In the 1980's we should complete the conversion of the economy to the intensive path of development and we should sharply raise labor productivity and the quality of labor. A rise in the level of economic work and the instilling of professionalism, responsibility and initiative in the personnel remain an indispensable condition for production successes."[19] The measures to achieve the designated objectives were set out in the decrees of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 and in the decisions of the November (1979) and June and October (1980) plenums of the CPSU Central Committee. The 26th CPSU Congress and its decisions will mark a new stage on the path to achieving these most important objectives in the development of the economy of mature socialism.

FOOTNOTES

1. V. I. Lenin, PSS [Complete Collected Works], Vol 36, p 7.

2. See "Materialy XXV S"yezda KPSS" [Materials of the 25th CPSU Congress], Moscow, Politizdat, 1976, p 58.

3. PRAVDA, 2 December 1980.

4. Ibid.

5. "Sovershenstvovaniye Khozyaystvennogo Mekhanizma" [Improving the Economic Mechanism], A Collection of Documents, Moscow, Pravda, 1980, p 7.

6. N. A. Tikhonov, "Izbrannyye Rechi i Stat'i" [Selected Speeches and Articles], Moscow, Politizdat, 1980, p 419.

7. ECONOMICHESKAYA GAZETA, No 39, 1980, p 4.

8. EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA [EKO], No 1, 1980, p 196.

9. EKONOMICHESKAYA GAZETA, No 39, 1980, p 4.

10. EKO, No 2, 1980, p 8.

11. "Materialy XXV S"yezda KPSS," p 131.

12. Ibid., p 61.

13. ZHURNALIST, No 9, 1980, pp 7-8; EKO, No 5, 1980, p 63.

14. See, for example, the article by A. G Sazykin, chairman of the RSFSR State Committee for Labor and Social Problems: "Personnel for Siberia: Demand and Reserves," EKO, No 5, 1980, p 7 et seq.

15. Ibid., p 8.

16. See ibid., pp 121, 123-124.

17. Ibid., No 8, 1980, p 7.

18. N. A. Tikhonov, op. cit., p 23.

19. PRAVDA, 22 October 1980, p 2.

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NEW AVERAGE GROWTH RATE INDICATOR FORMULA DESCRIBED

Moscow VESTNIK STATISTIKI in Russian No 3, Mar 81 pp 22-24

/Article by I. Paskhaver: "On the New Formula of the Average Growth Rate and Rate of Increase of Economic Indicators"/

/Text/ A new procedure of evaluating the fulfillment of five-year and annual plans is established in the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality." "To evaluate," it is stated in this decree, "the fulfillment of the five-year plan at all levels of economic management by a cumulative total from the beginning of the five-year plan, and of the annual plan by a cumulative total from the beginning of the year." This requires a change of the method of calculating the average annual growth rate and rate of increase of economic indicators, which so far have usually been calculated on the basis of only two extreme levels of the dynamic series being studied according to the equation of the geometric mean:

$$K = \sqrt[n]{\frac{y_n}{y_o}} ,$$

where K is the average annual or average monthly coefficient of growth; n is the number of intervals of time, that is, years or months, in the period being studied; (y_n/y_o) is the ratio of the last level of the dynamic series to the base level.

This equation, in our opinion, contains several substantial shortcomings. First, the coefficient K depends on only two extreme values of the dynamic series. All the other terms of the series, although they usually constitute the bulk, are not involved in the calculation of the mean. Second, since the individually taken levels of the dynamic series are subject to random variations, the geometric mean, which is calculated on the basis of only the extreme values of the series, is not free of contingencies. Third, the sum of the terms of the dynamic series which are calculated on the basis of the cited equation usually does not coincide with the sum of the dynamic series and, consequently, distorts reality. The enumerated shortcomings are not characteristic of the geometric mean, which is calculated according to the sum of the levels of the series.

The question of the method of calculating this mean is not examined in educational literature on statistics. Until recently there was also no general equation for calculating such a mean. In 1974 Ukrainian statisticians A. and I. Solyanik derived a simple general equation for calculating the average growth rate and rate of increase according to the sum of the levels of the dynamic series, which lend themselves to addition.

The approximate value of the coefficient of increase $a_0 = K - 1$ is determined according to the following equation:[1]

$$a_0 = \frac{-3N(N+1) + \sqrt{9N^2(N+1)^2 + 24\text{[illegible]}\,N)}}{2N(N^2-1)}$$

where N is the number of terms of the analyzed series of dynamics; [illegible] the cumulative data of the indicators for the entire period being studied, which consists of intervals, that is, $S = \sum_{i=1}^{N} y_i$; y_0 is the base level.

This equation can be simplified by dividing all the terms of the numerator by the denominator. Then it turns out that:

$$a_0 = \frac{-3}{2(N-1)} + \sqrt{\frac{9}{4(N-1)^2} + \frac{6}{N(N^2-1)}\left(\frac{S}{y_0} - N\right)}.$$

The equation is simplified even more after the substitution in it of the values of the number of terms of the dynamic series N. In particular,

$$\text{for}\quad N=5\quad a_0 = -\frac{3}{8} + \sqrt{\frac{9}{64} + \frac{1}{20}\left(\frac{S}{y_0} - 5\right)};$$

$$\text{for}\quad N=10\quad a_0 = -\frac{1}{6} + \sqrt{\frac{1}{36} + \frac{1}{165}\left(\frac{S}{y_0} - 10\right)}.$$

A. and I. Solyanik also obtained the following equation for calculating the error of the value of the coefficient a_0. If a is the exact value of a_0, then:

$$a_0 - a = \frac{N(N^2-1)(N-2)}{12(N^2+1)} \cdot a_0^3.$$

Let us examine the use of the obtained equations and their merits using the example cited in the following table (see the following page).

According to these data, $a_0 = -\frac{3}{8} + \sqrt{\frac{9}{64} + \frac{1}{20}\left(\frac{1667{,}4}{309{,}3} - 5\right)} = 0{,}025$. Consequently, the approximate value of the coefficient of growth is $K = 1 + a_0 = 1.025$, but, then, the growth rate is equal to 102.5 percent. Given $N = 5$, the error of this coefficient would be: $a_0 - a = \frac{5(5^2-1)(5-2)}{12(5^2+1)} \cdot 0{,}025^3 = \frac{360}{312} \cdot 0{,}025^3 < 0{,}000016$.

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[1] See EKONOMIKA SOVETSKOY UKRAINY, No 8, 1974, pp 75-78.

Dynamics of the Deliveries of Tractors to USSR Agriculture During the Years of the Ninth Five-Year Plan*

(1) Годы	(2) Фактические данные о ежегодных поставках (тыс.), y	(3) Данные о ежегодных поставках, полученные на основании среднегодовых коэффициентов роста, исчисленных		(6) Отклонения переменных средних уровней от фактических при расчете среднегодовых коэффициентов роста	
		(4) по значениям крайних уровней K=1,0367	(5) по сумме уровней K=1,0250	(7) по значениям крайних уровней (гр. 2—гр. 3)	(8) по сумме уровней (гр. 2—гр. 4)
1	2	3	4	5	6
1970	309,3	×	×	×	×
1971	313,2	320,65	317,03	− 7,45	− 3,83
1972	312,8	332,42	324,96	−19,62	−12,16
1973	323,0	344,62	333,08	−21,62	−10,08
1974	348,0	357,26	341,41	− 9,26	+ 6,59
1975	370,4	370,38	349,94	+ 0,02	+20,46
1971—1975	1667,4	1725,33	1666,42	−57,93	+ 0,98

Key:

1. Years
2. Actual data on annual deliveries (thousands), y
3. Data on annual deliveries, which were obtained on the basic of the average annual coefficients of growth, which were calculated
4. According to the values of the extreme levels, K=1.0367
5. According to the sum of the levels, K=1.0250
6. Deviations of the variable average levels from the actual levels with the calculation of the average annual coefficients of growth
7. According to the values of the extreme levels (column 2 - column 3)
8. According to the sum of the levels (column 2 - column 4)

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*The table was compiled according to the data of the statistical yearbook "Narodnoye khozyaystvo SSSR v 1975 godu" /The USSR National Economy in 1975/, Moscow, Statistika, 1976, p 335.

If we take into account that the coefficients of the growth and increase are usually calculated in economic estimates with an accuracy of 0.001 or 0.0001, the difference a_0-a, that is, the error of the coefficient of the growth and the increase, is so small that it is possible to ignore it and, in particular, it is possible to consider that the average annual coefficient of the growth of the deliveries of tractors during the years of the Ninth Five-Year Plan is K=1.025. According to the old equation of the geometric mean $K=\sqrt[5]{(370.4)/(309.3)}=1.0367$. But if the amounts of the annual deliveries of tractors are calculated according to this coefficient, by using the data of the table it turns out that during the five-year plan as a whole 1,725,300 tractors were delivered, while in fact 1,667,400 were delivered, that is, significantly fewer. If the same calculations are made according to the coefficient $K=1.025$, the amount of deliveries during the five-year plan coincides exactly with the actual data. This is the first advantage of the new equation of the calculation of the average annual growth rate as compared with the old equation. The second advantage consists in the fact that the annual deviations of the calculated levels from the actual levels are considerably smaller, while the sum of the deviations is equal to zero, which is typical of the mean as a resultant and corresponds to the mathematical characteristic of the mean. In our example the sum of the deviations is equal to 0.8, which is explained by rounding off in the estimates. The advantage of the new equation also consists in the fact that the technique of calculating the geometric mean is made considerably easier, for it does not involve the extraction of roots of high powers and, consequently, the taking of logarithms and antilogarithms.

Both of the examined equations are equations of the geometric mean, since they are based on a uniform principle of geometric progression, that is, each subsequent level of the series, which characterizes the development of the phenomenon, is equal to the preceding one which has been multiplied by some constant number for the given progression, which in mathematics is called the common ratio of a progression. But according to the old equation the last term of the dynamic series is the decisive characteristic of the mean, that is, the indicator which should be left untouched in the calculation, while according the new equation the sum of the terms of the series is this characteristic. Taking this into account, as well as the above-noted statistical and mathematical advantages of the examined equation of the geometric mean which is calculated according to the sum of the levels, we believe that it is necessary to introduce it in the extensive practice of statistical economic analysis and to assign it the proper place in the educational literature on the general theory of statistics. At the same time it should be emphasized that both methods of calculating the geometric mean give answers to different questions. The geometric mean, which is calculated according to the sum of the planned levels, answers the question, what should the average growth rate be during the planned period in order for the planned sum for the entire period to be obtained. A similar calculation according to the sum of the levels for the past period shows what the average growth rate was during this period. The geometric mean, which is calculated according to the value of the extreme levels, shows what the average growth rate should be in order to reach the desired level at the end of the period being studied. From what has been said it follows that in all instances when the planned or actual levels of the series, which lend themselves to addition over all the segments of time, are known, preference should be given to the method of determining the coefficients of growth or decrease according to the sum of the levels.

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PLANNING AND PLAN IMPLEMENTATION

ABALKIN ELABORATES PARTY STRATEGY FOR CURRENT PLAN

General Economic Strategy

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 3, Mar 81 pp 97-107

/Article by Doctor of Economic Sciences Professor L. Abalkin: "The Economic Strategy of the Party and the 11th Five-Year Plan"/

/Text/ The building of the mature socialist society required the elaboration of a long-range economic strategy aimed at the most complete utilization of its potentials and historical advantages. The further increase of the well-being of the Soviet people on the basis of the utilization of intensive factors of economic growth, the acceleration of scientific and technical progress and the increase of production efficiency became the highest goal of the policy outlined by the 24th and 25th party congresses.

The 10-year period of the implementation of the present economic policy made it possible to make substantial progress in all directions. The fact that the fixed production capital of the national economy increased more than twofold during the 1970's attests to the considerable strengthening of the production potential of the country. The output of industrial production during the indicated period increased by 1.8-fold. The national income used for consumption and accumulation increased by 55 percent, the per capita real income rose 45 percent.

The experience of the past decade has convincingly shown that the party in good time took into account the peculiarities of the economy of mature socialism and elaborated the correct, scientifically sound strategic policy. At the same time the new, specific conditions and tasks, which are characteristic of the period of the 1980's, have to be taken into account.

The long-term direction of the economic strategy has undergone further creative development and precise definition in the materials and documents of the 26th CPSU Congress. The fundamental unity of continuity and a truly innovative approach to the solution of the problems raised by life is a distinctive feature of the economic policy elaborated by the congress.

The Continuity of Economic Strategy and Consideration of the New Conditions

The consistency of the policy being pursued and the retention in it of continuity with the decisions made previously stem from the fact that this policy rests on the objective economic laws of socialism and thoroughly reflects the peculiarities and tasks of socio-economic progress at the present stage. The consistency and continuity of the policy are expressed in the highest goal of the economic strategy, the specification of the main directions and means of its achievement and the further improvement of the economy mechanism.

In the 1980's the CPSU is continuing the implementation of its economic strategy, the highest goal of which is the steady increase of the material and cultural standard of living of the people, the creation of the best conditions for the comprehensive development of the individual on the basis of the further increase of the efficiency of all social production, the growth of labor productivity and the increase of the social and labor activeness of the Soviet people. On the basis of the creative development of the Leninist principles of socialism management the management of the national economy has to be improved consistently with allowance made for the increased scale of production, the established economic relations and the requirements of the scientific and technical revolution for the purposes of the maximum utilization of the potentials and advantages of the economy of mature socialism.

At the same time the new conditions and tasks of socio-economic progress at the present stage are reflected in the strategic aims outlined by the 26th party congress. This concerns first of all the enrichment of the content of the highest goal of the economic strategy. The point is that, given the achieved standard of living of the people, the further increase of wages and the increase of the real income of the population cannot serve as an adequate expression of the development and improvement of the socialist way of life.

Today the creation of the best conditions for the comprehensive development of the individual--this greatest value of socialist society--is coming to the forefront. Therefore, along with the increase of social production and the increase of the real income of the population the implementation of a detailed program of social measures and the development of needs themselves are acquiring greater and greater importance.

The directives of the congress on the need to actively influence the formation of reasonable needs and esthetic tastes of the population; to increase the free time of workers and to increase the opportunities for the harmonious spiritual life of the people; to pursue an effective demographic policy, are of fundamental importance for the solution of the arising problems. These directives, which define precisely the stand on the highest goal of the economic strategy of the party, are called upon to become the starting point in planning and economic management, the activity of party and soviet organs and scientific research, which is devoted to the analysis of the objective laws of the development of needs and the means of their rational satisfaction.

The strengthening of the labor nature inherent in the socialist way of life is assuming particular importance in its further development. Labor was and remains the main sphere of the vital activity of man, the arena of the manifestation and realization of his abilities and a condition of harmonious, comprehensive development. Hence the importance which the party attaches to the improvement and facilitation of working conditions, the provision of extensive opportunities for the enhancement of its creative nature and the utmost decrease of manual, unskilled and difficult physical labor.

The consistent and purposeful work on the further consolidation and development of the socialist way of life will, of course, be accompanied by the struggle against such phenonema, which are alien to it, as consumerism, the worship of material things and all forms of the evasion of socially useful labor and the upsetting of the smoothness of labor.

What has been said has the goal to emphasize the new features which determine the main directions of the solution of social problems during the coming years, which lend a more extensive comprehensive nature than before to the program of socio-economic measures which are connected with the further development of the socialist way of life. However, this does not belittle the importance of the measures which are aimed at the improvement of wages, the development of public consumption funds and the solution of the food and housing problem. At the same time it is important to stress that all such measures are only a means for the comprehensive, harmonious development of the human personality.

The 1980's are contributing much that is new to the understanding of the means which lead to the achievement of the set goals. The Soviet Union, as was indicated at the 26th party congress, is entering this period with a mighty economic, scientific and technical potential and highly skilled personnel. The main task today is the better, most efficient use of the already created potential.

The thesis elaborated by the party that the efficient and economical use of natural, material and manpower resources is the decisive and most effective means of increasing the national wealth of the country is of fundamentally great importance for the proper understanding of the present tasks and the practice of socialist management. The point is that, given the present scale of production and the technical potentials, the expenditures on measures on saving resources are less than the expenditures on the increase of their production and extraction.

In the Accountability Report at the 26th CPSU Congress General Secretary of the CPSU Central Committee L. I. Brezhnev emphasized that we "are now capable of solving the greatest and most complicated problems. A simple, it would seem, and ordinary matter--a practical attitude toward public property, the ability to utilize completely and efficiency everything we have--is becoming the heart of economic policy. The initiative of labor collectives and mass party work should be aimed at this. Technical policy, investment policy and the system of plan and accounting indicators should be aimed at this."[1]

The tightening up of the policy of economy in the national economy and the sharp reduction of the losses which arise as a result of mismanagement are a major reserve of the increase of the efficiency of social production. In the next few years the efforts of planning and economic organs and the creative initiative of the masses will be aimed at its utilization. Thrift is one of the first precepts in the work of each economic link and in the organization of socialist competition.

Technical progress is a decisive factor in the drive for economy and thrift. The emphasis has to be placed on the development of resource-saving technology, the use of a processing method which ensures a decrease of the metal content and the consumption of power, the extensive use of low-waste and wasteless processes with few operations. The criteria of the progressiveness of new technology should also be formulated in a new way. Today only the technology which, along with an increase of labor productivity, ensures a decrease of the specific expenditures of raw materials, fuel and power, can be recognized as such.

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[1] PRAVDA, 24 February 1981.

Under present conditions the efficient use of the most important resource of economic growth--capital investments--is assuming particular urgency. Owing to a set of objective factors the growth rate and absolute increase of the amount of capital investments during the 11th Five-Year Plan are decreasing, which is attested by the data cited below.

	Capital investments for the 5-year period	
	growth rate, percent	absolute increase of amounts, billions of rubles
1966-1970	143	104
1971-1975	142	145
1976-1980	129	142
1981-1985	112-115	76-96

Nevertheless the national income is to be increased by 18-20 percent, which is 1.3- to 1.5-fold greater than the growth rate of the capital investments (it was not possible during any of the preceding five-year plans to ensure a lead of the growth rate of the national income over capital investments). Consequently, a regularity characteristic of the 1980's--the orientation not toward a significant increase of resources, but toward their most rational and efficient use--is also traced here. This applies to the better use of both the capital investments themselves (the overcoming of their dispersal, the elimination of above-standard unfinished production and so on) and the already created production potential in the form of operating fixed production capital.

A general characterization of the new processes of the development of social production during the coming period is contained in the directive on the need to complete the changeover of the economy to the path of intensive development. One of the cardinal problems of the present stage of the socio-economic development of the country consists in this. Much has to be done on all the components of the intensification of the economy: the acceleration of scientific and technical progress, the improvement of the use of natural and material resources, the perfection of the pattern of social production, the more complete consideration of the time factor.

A special place belongs to the further growth of labor production, the rate of which should be increased in all the sectors of physical production. The data on the growth rates of labor productivity during the 10th and 11th Five-Year Plans are cited below (in percent).

	1976-1980	1981-1985
Industry	117.5	123-125
Agriculture	115.3	122-124
Construction	111.6	115-117
Rail transport	101.9	110-112

Thus, along with the increase of the opportunities, which are being created by the mighty, highly developed potential and advantages of mature socialism, during the coming period the scope, as well as the complexity of the socio-economic problems will increase considerably. Their successful solution is impossible without a considerable increase of the level of planned management and the improvement of organization, order, discipline and responsibility.

Now that the Main Directions of USSR Economic and Social Development for 1981-1985 and the Period to 1990 have been approved by the 26th CPSU Congress, the quality of the 11th Five-Year Plan and the increase of the level of management in all the links of the economy are assuming decisive importance.

The Plan Is the Main Tool of the Implementation of the Economic Policy of the Party

In the system of the management of economic and social processes in the socialist society a central place and leading role belong to planning. Emphasizing the inseparability of socialism and the planned management of the economy, V. I. Lenin wrote: "Socialism is inconceivable... without systematic state organization which subjects tens of millions of people to the strictest observance of a single norm in the matter of the output and distribution of products."[2] The Central Committee in its decree "On the 50th Anniversary of the First Five-Year Plan of National Economic Development" characterized planning as one of the most important scientific and social achievements of the 20th century and of the revolutionary transformation of social life.

The role of plans, first of all five-year plans, in the accomplishment of the goals and tasks of the economic policy of the party is especially great. By means of the plans of economic and social development the strategic party directives on fundamental questions of the development of the national economy are translated into the language of specific tasks and practical actions. The more perfect planning is, the more completely the advantages of the socialist system are revealed and the greater the rate of social progress is.

Taking into account the role of planning in socialist society, it is also not hard to understand the enormous significance which the 11th Five-Year Plan is called upon to have in the implementation of the economic strategy elaborated by the 26th party congress. The orientation of the plan toward the solution of social problems has to be intensified, its assignments have to be aimed more consistently toward intensive factors of growth, a complete and reliable balance in the development of the national economy and the gradual elimination of bottlenecks have to be ensured.

In the process of drafting the five-year plan responsible tasks are assigned to all the links of management--from central planning and financial organs and ministries to production enterprises and associations. The place and role of each sector and republic in the development of the unified national economic complex of the country and in the implementation of the long-range economic strategy of the party are clearly specified in the Main Directions, which were approved by the congress. That is why it is important for the ministries and republics to stipulate in their plans the complete and unconditional fulfillment of the set tasks with the more efficient and economical use of state resources. Production, scientific production, construction and agro-industrial associations and enterprises of all the sectors of the economy can and should do much to mobilize the reserves of the increase of efficiency. However, the central planning, financial and economic organs, first of all USSR Gosplan--the main economic headquarters of the country--bear particular responsibility for the drafting of the 11th Five-Year Plan of the economic and social development of the country. They are obliged to execute in full the directives on the improvement of their work, which are contained in the materials of the 26th CPSU Congress.

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[2] V. I. Lenin, "Poln. sobr. soch." /Complete Works/, Vol 36, p 300.

After the determination of the main task and the main parameters of the five-year plan the achievement of the complete and efficient balance of its assignments assumes decisive importance. The classical definition of conformity to the plan, which was given by V. I. Lenin in his time, is well known. He wrote that "constant, deliberately maintained proportionality, indeed, would mean conformity to the plan...."[3]

In economic literature attention has been directed most of all to whether proportionality should be included in accordance with this thesis in the conformity to the plan, as well as to what extent the feature of deliberateness is inherent in the objective economic laws of socialism. But the main thing, it seems, does not lie in this. The main point of Lenin's formula is that only constantly maintained and, consequently, complete proportionality of social production characterizes conformity to the plan. The violation of proportionality, unfortunately, is not that rare and signifies the incomplete consideration or the direct neglect of the law of the planned development of the national economy.

Everything that has been said is by no means of purely theoretical significance, it has a direct bearing on the content of planning work. The point is that the plan acts as a mighty lever of the development of the economy only when all its assignments are completely coordinated with each other, when a program of the balanced development of all the links of the unified national economic complex of the country has been incorporated in it. Otherwise the influence of the plan decreases sharply.

It is also important to emphasize the fundamental thesis that the complete and effective balance of the economy acts as a precondition and a result of its changeover to the path of intensive development. In the case of the intensive type of expanded reproduction, of which accelerated retooling and substantial, quickly occurring structural changes are characteristic, the task of ensuring proportionality is complicated considerably. At the same time its solution becomes more and more urgent, since with the increasing socialization of production the disturbance of economic relations if only in one link adversely affects the entire chain of economic relations in the national economy. The lack of a lasting balance checks the increase of production efficiency and the use of intensive factors of growth. It has an adverse influence on the process of the specialization of production, hinders it, gives rise to the unsound practice of "self-supply" and thereby does not make it possible to put into use the mighty reserves of the increase of efficiency, which are connected with the use of the potentials of the specialization and concentration of production.

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[3] V. I. Lenin, "Poln. sobr. soch.," Vol 3, p 620.

All this characterizes balance as a condition, a prerequisite of the changeover of the economy to the path of intensive development. At present the balance of social production, which is complete and efficient, can be achieved only as a result of a consistent orientation toward intensive methods. The means for this is the planned reduction of the expenditures of material, natural, manpower and financial resources. This can be ensured on the basis of the extensive use in planning of a system of norms and standards, which take into account the latest achievements of science and technology and the advanced know-how of management.

The essence of the problem consists in the following. The norms and standards should be rigid, strenuous and aimed at the most effective technical and economic solutions. The needs for resources, which are determined in conformity with these norms and standards, should be met completely, which will also mean the achievement of a complete and efficient balance of the economy.

Precisely such an approach should be implemented in conformity with the directives of the 26th CPSU Congress when drafting the 11th Five-Year Plan of the economic and social development of the country. As is indicated in the Main Directions, which were approved by the congress, it is necessary to ensure the elaboration of balanced plan assignments according to all the indicators, by using progressive technical and economic standards.

The singling out of the priority directions in the development of the economy and the elaboration for their implementation of long-range goal programs do not contradict the requirement of the complete balance of the plan, although they do complicate the solution of this problem. The determination of priorities is connected, first, with the establishment of the priority of the problems being included in the plan for the given period (as compared with those which can be assigned to a later date) and, second, with the structural reorganization of social production as a whole, its individual sectors, intersectorial and territorial production complexes.

After selecting the versions it is necessary to back all the projects and assignments included in the five-year plan completely with resources according to the approved standards. Here there can be no question of whom to supply first and whom second--it is solved before the inclusion of the assignment in the plan. If the plan is indeed completely and efficiently balanced, this problem should not exist. The practice of priority supply is the product of an unbalanced economy, the inertia of thinking and economic practice, which should be combatted most resolutely.

Such an approach takes fully into account the present conditions and requirements and is based on the understanding of the economy as a unified national economic complex. It is also in keeping with the objective need to enhance the role of centralized state planning. In a speech at the October (1980) CPSU Central Committee Plenum L. I. Brezhnev said that "only the center can effectively manage this complex as a unified whole and oppose departmental and regional tendencies."[4]

The role of a balance is also increasing substantially in the solution of a large number of social problems. This concerns first of all the increase and realization of the real income of the population. In specifying the assignments in the area of social development and the increase of the national well-being for the 11th Five-Year Plan, the 26th party congress indicated that the more complete satisfaction of the consumer demand of the population for various goods and services is the most important task.

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[4] L. I. Brezhnev, "Rech' na Plenume Tsentral'nogo Komiteta KPSS 21 oktyabrya 1980 goda" /Speech at the CPSU Central Committee Plenum on 21 October 1980/, p 12.

However, the problem goes beyond this. The leading development of the supply of goods and services as compared with the increase of the monetary income of the population (and just such a ratio is necessary for the balance of the income and expenditures of the population, of supply and demand) not only is conducive to the meeting of the corresponding needs. It is no less important that in this situation the effectiveness of the entire system of economic stimulation and its active influence on the improvement of the end national economic results increase. At the same time the sense of social discontent, which arises in the case of the unbalanced growth of supply and demand, is eliminated, a moral and sociopsychological climate, which is conducive to normal life and labor activity and to the comprehensive development of the individual, is created.

Hence it is clear how important it is both in the 11th Five-Year Plan itself and during its implementation to realize these fundamental political requirements and aims.

In acting as the main tool of the implementation of the economic strategy of the party, the 11th Five-Year Plan is called upon to put into practice measures on the further improvement of the economic mechanism. Elaborated in conformity with the decisions of the 25th CPSU Congress and the provisions of the new USSR Constitution, they were reflected in the decree of the party Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality." The task is, it is stated in the decree, to increase the level of planning and management, to bring them in line with the requirements of the present stage--the stage of mature socialism, to achieve a considerable increase of the efficiency of social production, the acceleration of scientific and technical progress and the increase of labor productivity, the improvement of product quality and on this basis to ensure the steady growth of the economy of the country and the well-being of the Soviet people.

The measures on the improvement of planning and the entire economic mechanism will be implemented in the process of drafting the 11th Five-Year Plan and during its practical implementation. Complicated and very responsible work lies ahead here in order to fully realize the requirement of the transformation of the five-year plan of economic and social development into the main form of planning and the basis of the organization of economic operations at all levels. In particular, within the five-year plan balances of material and manpower resources and production capacities, a financial balance and a balance of the monetary income and expenditures of the population should be drawn up for each year; the formation of material and financial reserves for the needs of production, capital construction and scientific research work and, in necessary instances, of reserves of production capacities should be provided for according to the established standards; economic standards, including standards of the wage fund and the economic stimulation funds, should be approved.

The provision of completely balanced, stable plan assignments and economic standards to the main link of the national economy--production associations and enterprises--will be of particular importance for the successful development of social production and its systematic intensification, since it is in the primary units of the national economic complex that the process of physical production takes place, the latest achievements of science and technology are used, the process of labor is implemented and in the end the fate of the five-year plan is decided.

The ministries bear particular responsibility for the performance of this work. The assurance of the scientific soundness and quality of the plan assignments and economic standards, the creation of a stable outlook for each economic link and the dates of the adoption of new indicators of planning and cost accounting stimulation depend on them. It is necessary to eradicate the faulty practice of the frequent and unfounded adjustment of the plans of production associations and enterprises and not to permit the shifting of the damage done by individual economic links on to labor collectives which work well.

The all-round balance of the plan and the assurance of the stability of its assignments will make it possible to change over during the 11th Five-Year Plan to the new procedure of evaluating the fulfillment of the plan. Now it will be carried out not according to the sum of the annual plans, but according to a cumulative total from the beginning of the five-year plan on the basis of the assignments stipulated in the five-year plan, which will have an appreciable influence on the increase of the level of organization and responsibility in all economic operations.

The Increase of Organization, Responsibility and Discipline

In the development of social production there exists an objective law: the role of the organizational factor in the assurance of a high rate of socio-economic progress increases with the increase of its scale and the intensification of the social division of labor. The party takes this objective law fully into account when elaborating the long-range economic strategy and the program of measures which are aimed at its implementation. The questions of increasing the level of organization and improving order, of increasing responsibility and discipline occupied an important place in the materials of the 26th CPSU Congress. This is quite natural, since the practical implementation of the tasks set by the congress and the realism of our plans depend to a decisive extent on the reinforcement of organization, responsibility and discipline in all the links of the national economy and management. Today the problem of increasing planning and executive discipline and of improving order and organization hold a special place. This, as the congress indicated, is an indispensable condition of the successful fulfillment of the plans of economic and social development and the further increase of the well-being of the Soviet people.

The increase of the responsibility for the fulfillment of all plan assignments and contractual obligations is of great importance. However, there are key points and main, decisive guidelines here, and first of all the fulfillment of the assignments and obligations on the deliveries of products in the stipulated amount, assortment and quality and on the dates specified by the contracts. The placement of this task in the forefront is connected with the overall orientation of the economy toward the end national economic results, toward the consumer, that is, with the main tasks of the socio-economic policy of the party.

Indeed, for each economic link the meeting of the corresponding portion of the social needs which are specified in the obligations on deliveries of products acts as the end result of its activity. And each link is called upon to meet these needs completely and in good time, of course, with the most rational and efficient use of resources. That is why the main efforts of labor collectives, all the strength and power of socialist competition should be aimed precisely at the fulfillment of the assignments and obligations on deliveries of products. Only with the meeting of this requirement, that is, the complete and timely fulfillment of the plan of deliveries of products in conformity with the concluded contracts, is it possible to speak of the successful operation of production enterprises and associations and of industrial ministries as a whole.

Such an approach is notable for novelty, and its consistent use presumes the reinterpretation of some established notions and habits. The point is that the national economy needs not simply products worth millions of rubles, but strictly specified products, in the specified amount and assortment, which are of good quality and are delivered on the dates stipulated by the plan and contractual obligations. Under present conditions it is impossible to judge the successful work of a labor collective, a sector or an oblast, a kray on the basis of the fulfillment and exceeding of the plan on the total production volume (the commodity, sold or net production). Today it is not this that is the main thing. The final appraisal of the results of economic operations can be given only on the basis of the fulfillment of the assignments on the deliveries of products with the minimum expenditures.

A necessary condition of the practical implementation of this approach is, of course, the drafting of a completely balanced plan, which has already been discussed. But the matter is not limited to the drafting of the plan. It is just as important to ensure the strengthening of organization and executive discipline in all the links of the economy and the increase of the responsibility of personnel. A resolute struggle everywhere against attempts to shirk responsibility is needed.

An entire set of measures: administrative, economic and educational, has to be used extensively in the drive to increase responsibility. The work on increasing responsibility and discipline should become a matter of state and party organs, public organizations and ideological institutions.

A significant role in this set of measures belongs to the development and improvement of material interest and responsibility. They should be fundamentally linked with the overall orientation of socio-economic development toward the achievement of the best end results, which was elaborated by the party. The indicators of the end results of the activity of production associations and enterprises of industry: the fulfillment of the plan of the deliveries of products in conformity with the concluded contracts, the increase of labor productivity, the improvement of product quality and the increase of the profit (in some sectors the reduction of the production cost), are clearly specified in the decisions on the improvement of the economic mechanism. The end results of economic operations in construction and agriculture are specified in much the same way. The economic stimulation funds are formed precisely on the basis of the mentioned indicators.

The precise specification of the evaluating and fund-forming indicators creates a firm basis for the active use of the levers of material interest and responsibility. It should be emphasized that in this matter it is necessary to avoid all displays of leveling, which occurred in the past, since they sharply reduce the effectiveness and efficiency of economic levers and stimuli. The higher the level and quality of planning and the soundness of the plan assignments are, the more extensive the opportunities are for the use of the most effective forms of incentive and responsibility. The leading role of planning in the entire economic mechanism of socialist society is also displayed, in particular, in this.

The distinction of the end results of the economic operations of production associations and enterprises and of their internal subdivisions should be accompanied by the corresponding differentiation of the material incentive. And the more significant these distinctions are, the more substantial the differentiation of the incentive will be. The consistent meeting of this requirement conforms to the Leninist directive on the need for conformity between the measure of labor and the measure of consumption and to the policy elaborated by the party of a connection between the end results, on the one hand, and the wage and the entire system of economic stimulation, on the other.

The substantial tightening up of labor discipline as an important and necessary link of the increase of the level of organization in the national economy is among the most important and complicated tasks. The urgency with which this problem was raised and examined by the 26th CPSU Congress is explained by a number of reasons, of which there are two main ones. First, under present conditions as a result of the increased scale of production and the formed economic relations any disturbance which is allowed in any sector of national labor adversely affects the entire chain of economic ties and relations. Therefore, the tightening up of organization and discipline is important as never before.

Second, here and there the relaxation of labor discipline has been noted, a conciliatory, liberal attitude toward its violators is observed, the entire arsenal of available administrative, economic and ideological measures is not being used to tighten it up. Hence the considerable losses of working time, the incomplete utilization of the mighty production potential of sectors and enterprises and the squandering of the physical assets, which were created by the labor of the people and belong to them.

The consistent and purposeful tightening up of labor discipline is a major reserve of the further growth of the economy, the increase of the efficiency of social production and the fulfillment of the assignments of the 11th Five-Year Plan of the economic and social development of the country. It is in full accord with the basic interests of the Soviet people and is inseparably connected with the development of the labor activeness of the masses, with the goals and tasks of the long-range economic strategy of the party. As the 26th CPSU Congress indicated, the highest goal of the strategy, which the party will consistently implement during the 1980's, can be achieved on the basis of the further increase of the efficiency of all social production, the growth of labor productivity and the increase of the social and labor activeness of the Soviet people.

This is not only a means of achieving the set goals. The development of the social and labor activeness of the masses reflects the most profound democratism of the socialist system and its truly humane essence. The workers are appearing as the creators of all the economic, social and spiritual progress of society, of the society which is being developed in the name of man, by the labor, will and consciousness of the working masses themselves.

The extensive initiative of the masses, the support and comprehensive dissemination of advanced know-how and the stimulation of creative, constructive energy are the main means of the development of Soviet society, the main and most reliable guarantee of the successful implementation of the outlined plans.

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Efficiency Drive

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 8 Apr 81 p 3

/Article by Doctor of Economic Sciences Professor L. Abalkin: "The Management of Efficiency"/

/Text/ The management of the economy is frequently compared with a lever. It is indeed a mighty lever, which increases the strength of collective labor and helps to speed up economic and social progress. But today the improvement of management is a decisive condition of the use of the most abundant possibilities of mature socialism and the enormous potential which was created by the dedicated labor of generations of builders of socialist society. As L. I. Brezhnev said at the 26th party congress, "the solution of the problems which face us, the utilization of the possibilities which we have in many ways depend on the level of management of the national economy, the level of planning and administration."

You have undoubtedly noted that in the Main Directions for this five-year plan it is planned to increase the growth rate of the main sectors of the national economy. The output of industrial products should increase by 26-28 percent as compared with 24 percent during the 10th Five-Year Plan, while in agriculture the increase of output will be 12-14 percent as against 9 percent during the past 5 years. The absolute amounts of the increase of output will grow even more significantly. But the essence of the problem does not lie in this.

The most important feature of the present stage of development of our economy consists in the fact that its planned growth should be achieved with a relatively smaller commitment of resources: manpower, raw materials, fuel and power. The absolute increase of capital investments will also be less than during the past five-year plan.

Under these conditions is it possible to fulfill the tasks set by the congress without a thorough reorganization of the economy? Hardly. For this reason such a strong emphasis was also placed at the congress on the improvement of the management of the national economy.

Great efficiency will not come about of its own accord. It is necessary to control its increase. Therefore the orientation of the economic mechanism toward the achievement of high end results and toward intensive methods of management is the essence of the new stage of the improvement of the planned management of the economy.

Fundamental decisions on many key issues of the improvement of the mechanism and methods of management were made, as is known, in mid-1979 and were approved by the 26th CPSU Congress. The coordinated improvement of the system of plan indicators and the methods of planning, the enhancement of the role of economic contracts and the intensification of cost accounting stimulation, the tightening up of planning and technological discipline and the promotion of financial and credit levers are called for in them. Now it is important to adopt the outlined measures completely, in good time and necessarily comprehensively. Passivity and slowness in this matter cannot have any grounds.

Where does the control of the increase of efficiency begin? With the drafting of the five-year plan. For the 11th Five-Year Plan this plan is being drafted in conformity with the directives of the congress. It should include the most advanced technical and economic decisions and the latest achievements of science and advanced know-how.

Particular responsibility for its drafting rests, of course, with USSR Gosplan--the main economic headquarters of the country. Its tasks and functions are precisely defined, and here, as they say, everything is clear. At the same time, the five-year plan in all the diversity of its relations and manifestations is a truly national matter. Much in it depends on sectorial ministries and republic organs, on the collectives of enterprises and associations. Guided by the decisions of the 25th congress, they are called upon to determine the most economical and efficient means of achieving the set goals, and for this they are called upon to master the art of managing efficiency.

It can be said without exaggeration that today the political maturity and practical attributes of the workers of all spheres of management are measured by their ability to find and put into practice the intensive factors of economic growth and to achieve high end results on the basis of the allocated limits. And, on the contrary, persistence in "knocking out" funds instead of painstaking organizing work on the use of available resources is an indication of the near-sightedness of personnel and the lack of understanding of the new conditions and new requirements of management.

Today the requirement of a complete balance is being placed in the forefront of the plan itself. This is the alpha and omega of socialist planning. Any, even the slightest disturbance of the balance, which is incorporated in the plan, is at variance with logic and the requirements of objective economic laws. It deprives the plan of scientific validity, sharply decreases its effectiveness and inevitably leads to the loss of the potential impact.

But the plan balance is not only a condition of great efficiency, but also its result. The point is that under present conditions the proportions of expanded reproduction can be ensured if progressive systems of norms and standards, which provide for the efficient use of resources and the increase of the output of the final product for each unit of them, are adopted. The elaboration and adoption of such systems are an important link in the mechanism of the management of the increase of efficiency.

The essence of a balance consists in the achievement of a correspondence between the volume and pattern of production and consumption. But our needs are always specific. The report that the shoe industry has exceeded the plan on the output of rubber boots will hardly please those who need sports shoes. Therefore economic operations should be oriented toward the consumer and toward the most complete satisfaction of his specific demands. But this means that it is now necessary to form the products list and the product assortment, the entire production program on the basis of the so-called backlog of orders. As for the results, today they should be evaluated first of all subject to the fulfillment of the obligations on deliveries of products in conformity with concluded contracts.

Decisions on this have also been made. Such an approach, beyond any doubt, should become and will be the norm of the practical activity of every economic link and every labor collective. But there is a question here, on which I would like to dwell in a little more detail in connection with the drafting of five-year plans and the adoption of socialist obligations. What is now required of each economic link? The complete and timely fulfillment of the plan assignments and contractual obligations on the deliveries of products. Of course, with the minimum expenditures. That, strictly speaking, is all.

But where today is the weakest point, which is checking economic growth and efficiency? Any economic manager, any person knowing modern production would say the disruption of deliveries of products. So it is: everyone knows his duties, but the flow of quite legitimate complaints against these weak points is not decreasing. Obviously, the complainers are looking at themselves from only one direction--as consumers, and forget that they are also suppliers.

The indicator of the deliveries of products--and this must not be forgotten for a minute--is not a secondary indicator which makes the assignments by volume more precise. It is, perhaps, the most important indicator: now it has been elevated to the rank of one of the main criteria of the end results of the economic operations of enterprises and associations. An orientation not toward the total volumes, but toward the meeting of needs--this is the essence of this criterion, and at the same time of the new approach to the management of the economy.

And here I would like to direct your attention to one distinctive feature of the assignments on the deliveries of products in conformity with concluded contracts. It is that it is in principle impossible to exceed them--why do something that no one has ordered?! But this, you will agree, in many ways is at variance with customary notions. If the main thing is the fulfillment of the assignments on deliveries, if overfulfillment here is nonsense, then where should the initiative and creative energy of the masses be directed?

First of all, and the experience of the leading collectives attests to this, the complete and unconditional fulfillment of the obligations on deliveries is an exceptionally complicated matter which requires enormous efforts and the radical improvement of the organization of the matter. The broadest sphere for a creative quest is right here. Hence, today the acceleration of scientific and technical progress, the improvement of product quality and the policy of economy are becoming objectives of competition.

Of course, other spheres of the exertion of initiative might also exist in different sectors and at individual enterprises, but one thing should be indispensable--only that activity, which ensures the meeting of the obligations to consumers, can be recognized as successful.

The main guideline of management is to meet the demands of consumers with the minimum expenditures. And success depends to a decisive extent on the quality of the economic mechanism and on its skillful tuning to present demands. It is a question of the substantial improvement of planning work, the increase of the effectiveness of economic levers and the improvement of wages. But there is also something to think about here.

The question is as follows: What preconditions are necessary for an effective system of stimulation and responsibility? For the present in our country cases of leveling are also frequent. But this has an extremely harmful effect both on production indicators and on the psychology of people. The reward should be differentiated to the same extent that the end results of economic operations differ subtantially. I will recall in this connection the words of L. I. Brezhnev. "It is necessary," he said at the 26th party congress, "to stimulate conscientious workers in every possible way, not to leave loafers and bad workers loopholes for a good life with worthless work. Whoever wants to live better should work more and better."

The task now is to ensure the practical implementation of this principle. The executives of ministries and departments, enterprises and associations, the labor collectives themselves and their public organizations possess extensive rights for this. It is important to learn to use them skillfully in order to constantly improve the work of each link of the unified national economic organism. An inexhaustible source of the increase of production efficiency and the acceleration of our economic and social progress is visible in this.

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RESOURCE UTILIZATION AND SUPPLY

PLANNERS, MINISTRIES URGED TO CONSERVE RESOURCES

Efficient Resource Utilization Program

Moscow EKONOMICHESKAYA GAZETA in Russian No 13, Mar 81 p 10

[Article by N. Lobachev: "Reduction in Material Intensiveness"]

[Text] A decisive increase in the efficiency of public production is one of the fundamental directions in the party's economic strategy. Special attention is paid to its main components--rise in labor productivity, improvement in the utilization of productive capital in all national economic sectors, increase in the capital-output ratio and reduction in the material intensiveness of public production, that is, decrease in the expenditure of raw materials and supplies per ruble of the national income.

Efficiency Potential

Every 10 years the volume of consumption of raw materials, supplies and fuel in our country almost doubles. However, drawing new deposits into the economic turnover is connected with growing capital investments, in particular if we take into consideration that an ever greater amount of raw material resources come from Siberia and the Far East. "The country's needs for power and raw materials are growing constantly," L. I. Brezhnev said, "and their production is ever more expensive. Therefore, in order not to increase capital investments excessively, it is necessary to strive for a more rational utilization of resources, including as a result of a reduction in material intensiveness, use of cheaper and efficient materials and their economical expenditure."

It has been estimated that the expenditures on measures for saving material resources are much lower than the outlays on an increase in the extraction of additional fuel, raw materials and other types of material resources. For example, in machine building the expenditures on saving 1 ton of rolled metal products are approximately 250 to 300 rubles. This is one-fifth of the one-time capital expenditures on the establishment of additional capacities for the production of 1 ton of rolled metal products with due regard for all the expenditures on the extraction of an additional amount of ore and fuel and on the smelting of cast iron, steel and so forth.

A serious change toward a sharp improvement in the utilization of available material resources will have to be made in the 1980's. A rational and economical expenditure of raw materials, supplies and fuel is the most effective way of increasing the country's national wealth.

A reduction in the material intensiveness of production is one of the major potentials for public labor productivity growth and for an economical utilization of financial, labor and natural resources. For example, 1 percent of the saving of material resources utilized in the national economy is equivalent to the creation of 6 billion rubles of the national income and from the saved material resources it is possible to produce additional products for the total amount of more than 10 billion rubles.

Ways of Saving

Basic Trends stress the need for the maximum possible saving of all types of resources, primarily material ones. They set the task of saving fuel and power resources in the amount of 160 to 170 million tons of conventional fuel in 1985 as compared with 1980, significantly reducing the expenditure of rolled ferrous metal products, steel pipes and rolled nonferrous metal products in machine building and metalworking and ensuring a significant saving of nonferrous metal, timber and cement in construction.

In the 11th Five-Year Plan special attention is given to the development and introduction of energy and resource saving equipment and technology, waste-free industrial processes and processes ensuring an overall processing of raw materials.

Drawing secondary material and fuel and power resources into circulation is an important direction in the reduction in material intensiveness. The possibilities of saving material resources as a result of an overall utilization of natural raw materials, as well as drawing industrial and household waste into the economic turnover, are truly vast.

To fulfill the decisions of the 26th CPSU Congress, ministries and departments will have to take measures to drastically reduce all kinds of losses of material resources, especially during transportation and storage. The norms of natural and permissible losses, most of which have been in effect for many years and often do not meet the new conditions of production, transportation and storage, should also be revised.

The speed of movement of material resources in the process of public production is also of great importance. Often enterprises and construction projects accumulate large excessive resources of materials and equipment. Speeding up the rate of turnover of material resources even by 1 day makes it possible to additionally invest more than 1.5 billion rubles in the development of our economy.

To Improve Indicators

Intensification of the policy of economy in production is a major overall national economic problem, whose solution requires a new approach. The material intensiveness of output is one of the generalizing indicators of the level of utilization of raw materials, supplies, fuel, power and other objects of labor.

Attention should be drawn to the methods of calculating the indicator of material intensiveness. It should not be considered the share of all material expenditures in the value of the gross national product, which, when the expenditures of live labor are lowered (labor productivity grows), should naturally increase. Meanwhile, material intensiveness is the ratio of material expenditures to the amount of the national income (net output) without taking into account the amount of depreciation, whose share increases in the course of technical progress. Therefore, when the level of management and intensification of the utilization of material resources rises, material intensiveness should be lowered naturally.

When drawing up the program for the 11th Five-Year Plan, it is important to envisage a significant reduction in material intensiveness. This results both from the policy of a decisive increase in efficiency and from the available great potentials for saving material resources. The experience of the German Democratic Republic, to which L. I. Brezhnev drew attention in his report at the 26th congress, shows that with well-organized work on an intensified utilization of material resources it is possible to attain a 3-percent increase in output per percent of increase in resources.

Taking into consideration the importance of this indicator for ensuring an increase in the efficiency of public production, it would be adviseable to make it a planning indicator. The advantage of the indicator of material intensiveness lies in the fact that it is concerned with the level of utilization of the totality of material resources, not of some individual types of material resources. The overall approach to the efficiency of their utilization is fundamentally important, because in economic practice many types of material resources are interchangeable. When drawing up the five-year plan, it would be adviseable to envisage planned assignments for a reduction in material intensiveness of output in key national economic sectors and in physical terms.

The inclusion as of 1981 of assignments for an increase in the coefficients of metal utilization in the national economic plan is fundamentally important. Many machine building ministries, showing a reduction in the average norms of expenditure of rolled metal products in annual reports, over a period of many years do not increase the coefficient of metal utilization, which leads to an increase in production costs.

Strengthening performance discipline--labor, technological and planning--will also contribute to a rational utilization of resources.

Overall Approach

Basic Trends stress the need for the attainment in the interests of society of the greatest results with the smallest expenditures. According to the estimates of economists, a more rational and economical utilization of material resources can ensure no less than 3 to 4 percent of the reduction in material intensiveness during the 11th Five-Year Plan, which will make it possible to save tens of billions of rubles and, as a result of this, to obtain no less than 25 to 30 percent of the increase in the final social product. These calculations are based on the fact that the totality of the effect resulting from a reduction in the material intensiveness of output is evaluated. This includes the saving of capital investments, as well as the production of additional products as a result of the material resources released when material intensiveness is reduced. A rise in the share of the consumption fund in the national income and an increase in the possibilities of raising the rates of growth of the standard of living of the Soviet people are the generalizing results of a reduction in material intensiveness. Our economic science should do some work so it may give us a system of methods of measuring the full national economic efficiency from a reduction in the material intensiveness of output.

When developing the 11th Five-Year Plan, it seems advisable to develop, with the participation of the USSR State Planning Committee, the USSR State Committee for Material and Technical Supply and sectorial ministries, a program of specific measures for a rational utilization and saving of material resources, which should be directed toward a reduction in the material intensiveness of public production and provision of a more rational utilization of raw materials, supplies, fuel and power. This program should be based on sectorial programs drawn up by ministries and departments, as well as on territorial programs.

The programs will be able to include all the problems pertaining directly to a reduction in the material intensiveness of output, rational utilization of resources, replacement of scarce types of raw materials and use of waste and secondary raw materials. They will reflect the reduction in the consumption of raw materials and supplies through the establishment of scientifically substantiated norms of their expenditure.

Management of Economy

However, the main thing is to establish an effective system of managing the process and to constantly control the realization of these programs. Under present conditions there is an urgent need to increase the role of the USSR State Committee for Material and Technical Supply as a natural organizer in the implementation of the statewide program for a rational utilization and saving of material resources. Basic Trends clearly formulate the following: "To strengthen and improve the statewide system for material and technical supply and to increase its role and responsibility for a rational utilization and saving of material resources and a regular supply of raw materials, supplies, equipment and spare parts for the national economy." The solution of these problems will create an important economic and organizational base for an accelerated transfer of the economy to the path of intensive development.

The long-term practical experience of the bodies of the statewide system for material and technical supply shows that the satisfaction of the needs for material resources is organically connected with the many-sided activity of supply bodies, primarily in specifying the needs for material resources and in introducing measures aimed at reducing the consumption of raw materials and supplies, ensuring a prompt replacement of scarce types of materials with less scarce types and introducing more efficient, new types.

Of course, the problem of a rational utilization and saving of our country's vast material resources is a complex matter. The USSR State Planning Committee, the USSR State Committee for Science and Technology, sectorial ministries, associations, enterprises and construction projects will participate in its solution. It is important to ensure a coordination of the forces and funds of planning, scientific research, design and technological organizations. In connection with this a question arises as to the advisability of having an interdepartmental council for a rational utilization and saving of material resources under the USSR State Committee for Material and Technical Supply, which would combine the efforts of all ministries, departments and scientific organizations in the area of increase in the efficiency of material consumption and would be able to solve urgent intersectorial problems.

At the same time, it is necessary to intensify control and to increase the responsibility of ministries, associations and enterprises for an economical expenditure of resources. Socialist competition and the participation of all workers in this enterprise occupy a special place in the fight for a better utilization of supplies, raw materials and fuel and power resources. The implementation of extensive measures for moral and material incentives for the saving of material resources will be of great importance for the success of this matter.

Summing up the approach to the accomplishment of the task for an increase in economic efficiency set in the report to the 26th CPSU Congress, L. I. Brezhnev said the following: "A seemingly simple and very humdrum matter--a proprietary attitude toward public wealth and the ability to fully and expediently utilize everything that we have--is becoming the core of the economic policy. The technical policy, the policy of capital investments and the system of planning and report indicators should be directed toward this."

Measures To Save Resources

Moscow EKONOMICHESKAYA GAZETA in Russian No 14, Apr 81 p 6

[Interview with Nikolay Vasil'yevich Martynov, deputy chairman of the USSR Council of Ministers, chairman of the USSR State Committee for Material and Technical Supply, by correspondent of EKONOMICHESKAYA GAZETA: "Material and Technical Supply for the Five-Year Plan"; date and place not specified]

> [Text] The decree of the 26th CPSU Congress entrusted the USSR Council of Ministers with developing in accordance with Basic Trends a draft of the state plan for the economic and social development of the USSR for 1981-1985 and with submitting it to the USSR Supreme Soviet for consideration in October 1981.
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> Nikolay Vasil'yevich Martynov, deputy chairman of the USSR Council of Ministers, chairman of the USSR State Committee for Material and Technical Supply, discussed the role of the USSR State Committee for Material and Technical Supply in the preparation of the draft of the new five-year plan with a correspondent of EKONOMICHESKAYA GAZETA.

[Question] Nikolay Vasil'yevich, what basic problems are solved by the USSR State Committee for Material and Technical Supply during the preparation of the five-year plan?

[Answer] A focus on economy, that is, on a fuller and rational utilization of what the country has at its disposal, is the main thing that now characterizes the work on the preparation of the 11th Five-Year Plan done by the USSR State Committee for Material and Technical Supply and its bodies. It is based on Comrade L. I. Brezhnev's directive "so that the results of production may grow more rapidly than the expenditures on it, so that, drawing comparatively fewer resources into production, more could be attained."

This line of an intensified utilization of material resources is clearly observed in Basic Trends in the Development of the National Economy for 1981-1985 and for the Period Until 1990. For example, during the 11th Five-Year Plan the output of finished rolled metal products is to be increased by 14 to 16 percent and for such metal consuming sectors as machine building and metalworking production growth of no less than 40 percent has been established.

Perhaps a miscalculation has been made here? Not at all. First, plans have been made to fundamentally change the structure of building materials as a result of an outstripping growth of the most progressive of them. For example, the output of cold rolled sheet is to be increased 1.8-fold, of rolled metal products with hardening heat treatment, 2.3-fold, of bent steel sections, 2.3-fold and so forth. All this, even with a relatively small increase in the output of metal in tonnage, will make it possible to meet the needs of the national economy for it much more fully. Along with this a set of measures for an improvement in metal utilization in consuming sectors, primarily as a result of the utilization of low-waste technology and the introduction of advanced design solutions and improved metalworking equipment, has been envisaged. Outstripping rates are also established for the output of such metal substitutes as synthetic fibers and plastics.

All this indicates that the assignments for the saving and rational utilization of material resources envisaged by Basic Trends are reinforced with a wide set of measures in all national economic spheres. The task of the USSR State Committee for Material and Technical Supply, as well as of other bodies working on the 11th Five-Year Plan, is to translate these measures into specific detailed planned assignments for all sectors and regions. At the same time, special attention is paid to the balance of the plan, that is, a close coordination of the assignments for production with its material and technical supply both in sectorial and territorial terms.

For this purpose the committee's territorial bodies, that is, state committees for material and technical supply of the Union republics and main territorial administrations, along with the central subdivisions of the USSR State Committee for Material and Technical Supply, are widely enlisted in plan development.

The USSR State Committee for Material and Technical Supply and its bodies together with ministries, departments and the councils of ministers of the Union republics did rather extensive work on the study of the needs of the national economy for specific types of products for the forthcoming 5-year period and for the period until 1990 and worked out measures (with substantiations and calculations) to overcome the bottlenecks in meeting the needs for some types of raw materials, supplies and articles.

Work is now done with the State Planning Committee and ministries so that these measures may be maximally taken into account in the assignments of the five-year plan. At the same time, great importance is attached to increasing the output of economical types of materials and articles with a simultaneous removal of obsolete material intensive output from production, more fully drawing secondary material and fuel and power resources, as well as uninstalled equipment, above-standard stocks and surplus physical assets, into the economic turnover, reducing losses of products during storage and transportation, efficiently utilizing the production capacities existing in the national economy and speedi y commissioning reconstructed enterprises and enterprises under construction.

In the balances and plans for the distribution of material resources for the 11th Five-Year Plan--the USSR State Committee for Material and Technical Supply develops such balances and plans for distribution for 300 key types of products--much attention is paid to the introduction of progressive norms of expenditure of output and to the concentration of resources where they will produce the greatest national economic effect.

As a result of the revision of the norms of expenditure of output distributed by the USSR State Committee for Material and Technical Supply, about 300 million rubles were saved during the past five-year plan. The saving resulting from stricter norms of natural losses totaled 150 million rubles. This work, only on an even bigger scale, will also continue during the 11th Five-Year Plan.

Specific assignments for the saving of material resources will be established for ministries, Union republics, associations and enterprises. They should be considered minimal and subject to mandatory fulfillment.

In the planning work of the subdivisions of the USSR State Committee for Material and Technical Supply one of the central places is now assigned to an improvement in material and technical supply for all the units of the agroindustrial complex, as well as for enterprises producing consumer goods. Potentials for an increase in the sale of timber, building materials, sanitary engineering equipment, metal articles and other products to the population are also uncovered. At the same time, a further intensification of the policy of economy of these materials and articles in industry and construction is the main potential.

There are also a number of other problems, which are now being solved by the USSR State Committee for Material and Technical Supply in the course of work on the draft of the 11th Five-Year Plan.

/Question/ Can you disclose at a somewhat greater length some directions in the increase in the efficiency of utilization of material resources and the role of the USSR State Committee for Material and Technical Supply in these matters?

/Answer/ A major potential for saving lies in an increase in the mobility of the stocks of material resources in the national economy. Speeding up their rate of turnover by only 1 day makes it possible to additionally invest more than 1.5 billion rubles in economic development.

Basic Trends envisage speeding up the rate of turnover of circulating capital by 2 to 3 days.

The solution of this problem depends on an efficient work of all national economic units, that is, industry, transport, material and technical supply bodies, construction and other consuming sectors. A strict fulfillment of planned assignments and contractual obligations by all labor collectives is the main condition.

Builders have especially big potentials. The rate of turnover of the stocks of material resources in contracting construction organizations has slowed down considerably in the last few years.

During the past five-year plan the bodies of the USSR State Committee for Material and Technical Supply drew resources worth about 15 billion rubles from above-standard stocks and surplus physical assets into the economic turnover. However, it was not possible to stop the growth of above-standard stocks. The government has broadened the rights of the USSR State Committee for Material and Technical Supply in these matters. Control over the level of stocks at enterprises and construction projects has intensified. Measures are implemented to improve the regulation of deliveries to consumers on the basis of the level of surplus of certain types of products. For construction organizations the delivery of articles and accessory equipment is to be made mainly with due regard for the construction readiness of projects.

The checks on the substantiation of the norms of expenditure and stocks of material resources used by enterprises and construction organizations made by the bodies of the USSR State Committee for Material and Technical Supply also contribute to preventing an unjustified withdrawal of materials and articles for stocks.

Plans have also been made to increase the concentration of circulating resources at enterprises based on the deliveries of the USSR State Committee for Material and Technical Supply. This gives a considerable effect. An increase of 1 million rubles in commodity stocks in the statewide supply system makes it possible to lower production stocks among consumers by 1.4 to 1.5 million rubles. At the same time, a significant expansion of the volume of production services rendered to consumers is envisaged. At their order the delivered materials are cut out, repackaged and sorted out, which additionally saves up to 10 percent of these materials.

Among the other directions in the work on saving resources pursued by the bodies of the USSR State Committee for Material and Technical Supply the check on the applicability of the output ordered by consumers can be mentioned. Often materials and articles with superfluous parameters are ordered. As a result of such checks alone acutely scarce nonferrous metal worth about 450 million rubles, as well as a number of other types of products, was saved during the 10th Five-Year Plan.

Great importance is also attached to an improvement in the utilization of secondary resources. For example, the volume of waste paper procurements should triple by 1985. The capacities of enterprises for the processing of secondary raw materials and for the output of finished products are expanding. They include the two biggest enterprises for the output of cardboard from waste paper in Europe and enterprises for the processing of textile and polymer waste, worn out tires and other products.

The collection and utilization of reusable wooden and cardboard containers are very effective directions. During the 10th Five-Year Plan this work made it possible to protect 1 million hectares of forest from felling and to save 2.5 billion rubles.

Of course, the enumerated directions do not exhaust all the work on the saving of material resources done by the bodies of the State Committee for Material and Technical Supply. The tasks set by the 26th CPSU Congress for the statewide system of material and technical supply in this matter require a search for new directions and new approaches. The efforts of all the labor collectives of the USSR State Committee for Material and Technical Supply in the center and in the localities are now concentrated on this.

Improvement in Warehousing Services

Moscow EKONOMICHESKAYA GAZETA in Russian No 12, Mar 81 p 8

[Article by S. Abramov, candidate of economic sciences: "The Country's Warehousing Services"]

[Text] The development of warehousing services is one of the important prerequisites for the further intensification of public production, improvement in the distribution and rational utilization of material and labor resources and rise in labor productivity.

Basic Trends in the country's economic and social development approved by the 26th CPSU Congress set the task of ensuring an accelerated growth of the sectors of the production infrastructure, whose important elements are warehousing services. Their development will contribute to a more economical and efficient utilization of material resources.

An overall mechanization and automation of loading-unloading, transport lifting and warehousing operations will greatly improve the safety of material resources and accelerate the turnover of productive capital and the movement of supplies. A rise in the level of mechanization of these operations will make it possible to save the labor of 1.5 to 2 million people in 1985.

Development of Object Program

Improvement in warehousing services is connected with the solution of a set of complex problems. They include the development of machines and mechanisms ensuring the utilization of advanced freight processing technology, elimination of manual and heavy labor and problems of improvement in the construction of warehouse premises and labor organization. The need to use the method of object programs for the solution of this major national economic problems was recognized. Noting its advantages, L. I. Brezhnev stated the following at the October (1980) Plenum of the CPSU Central Committee: "Each such program should represent a substantiated plan of measures directed toward [illegible]nal result, toward a complete solution of a certain problem, a plan based on accurate calculations." The program determines the stages and order of operations and the necessary financial and material resources and the envisaged measures involve various ministries and departments connected with this problem.

Calculations show that the realization of the elaborated long-term national economic object program for the development of the country's warehousing services for the period until 2000 will make it possible to obtain a significant economic effect and to accelerate the mechanization and automation of manual labor.

A general scheme for the warehouses of supply bodies and proposals for the development of warehousing services at industrial, construction and transport enterprises were prepared at the first stage of elaboration of the object program. An object program for the overall development of warehousing services for the period until 2000 and its indicators will be prepared at the second stage.

An evaluation of the state of warehousing services made by sectorial scientific research and planning organizations in accordance with the methodological instructions of the Scientific Research Institute of Economics and Organization of Material and Technical Supply of the USSR State Committee for Material and Technical Supply was the most important component of the first stage. This work was done on the basis of standard norms completed for every warehouse, economic region and ministry. The capacity and structure of freight turnover, number of workers and volume of performed operations by warehouse workers, pool of transport lifting, loading-unloading and stacking equipment, economic indicators of production activity, fixed capital and the indicators of its utilization were established.

An evaluation of the organizational and technical level and efficiency of utilization of warehouses was made by an analysis and comparison of the actual values of the indicators of the appropriate types of warehouses with last year's level, planned and calculated indicators and normatives established in standard plans.

The processing of the examination results by means of a computer made it possible to prepare proposals on the basic directions in the improvement in the warehousing services of supply bodies and to develop the indicators of the general scheme, as well as proposals for the object program for the development of the warehouses of industrial, construction and transport enterprises.

The set of proposals for the development and improvement of warehouse facilities and increase in the efficiency of their functioning can be subdivided with a certain degree of conditionality into organizational and technical. The former include measures aimed at coordinating the rates of development of warehouses and production, maximally utilizing the advantages of the statewide supply system, increasing the technical equipment of warehousing services and improving the labor organization of warehouse workers.

The second group of proposals includes an increase in the warehousing height, improvement in the technology of warehouse freight processing, acceleration and reduction in the cost of new construction and reconstruction and expansion of existing warehouses.

Reconstruction and New Construction

Warehouse areas are replenished both as a result of the reconstruction and retooling of existing buildings and structures and the construction of new ones.

Construction work on a number of large general-purpose highly mechanized warehouse complexes of an annual capacity of 50,000 to 100,000 tons of freight turnover in Volgograd, Minsk, L'vov and Irkutsk was completed during the 10th Five-Year Plan. Enterprises of extensive commodity specialization with the use of lightened elements and the utilization of shelving as supporting structures designed for a height storage of products were put into operation. The new warehouse buildings and structures in their volume planning and design solutions make it possible to introduce an overall mechanization and automation of warehouse freight processing. Suffice it to mention the warehousing services of such advanced associations as AvtoVAZ and AvtoZIL.

The reconstruction of projects carried out during the 10th Five-Year Plan is equivalent to the commissioning of more than 2 million square meters of warehouse areas. However, the proportion of this work in the total volume of capital construction still remains insignificant.

Reconstruction is not economically advisable for all projects. For a number of them the specific capital expenditures per unit of increase in capacity are equal to or even higher than in new construction. This is due to the high labor intensiveness and cost of construction work, in particular the replanning of buildings in connection with the change in the technology of freight processing and storage and the replacement of ceilings.

The new technological solutions of freight processing and the use of modern building materials and shelving as building structures made it possible to reduce to a significant degree the specific expenditures and time on the construction of warehouses. For example, the cost of 1 ton of warehouse capacity made of reinforced concrete structures is 1,200 rubles and, when metal section decking reinforced directly at the shelving is used as structures, 865 rubles.

The spread of warehouses of the "module" type also contributes to a reduction in the cost of construction and installation work and to a rise in the level of prefabrication of warehouse structures. The presence of large free areas in them makes it possible to use various technological solutions.

Mechanization of Warehouse Operations

Modern warehousing services are inconceivable without an organization of transportation by the package-container method. For example, the packaging of heating radiators will make it possible to lower the expenditures of labor on the performance of loading and unloading operations by 85 percent. As a result, the utilization of the area and volume of a warehouse is improved, considerable funds are saved on packaging-transport operations, layovers of cars are reduced and labor productivity grows.

Package-container transportation opens up great opportunities for an overall mechanization of warehouse operations, introduction of fundamentally new industrial processes and establishment of fully automated warehouses.

A mass delivery of package-container freight according to the most advanced technology has not yet been organized properly. In particular, it is hampered by the weak interest of ministries and departments in lowering the expenditures on loading and unloading operations and by the unsubstantiated distribution of the expenditures on the establishment and maintenance of the container pool and of the profit from a better utilization of railroad cars and warehouses between the supplier and the consumer.

The processing of containers requires special equipment. It is advisable to develop and increase the network of special centers fitted with the necessary equipment for the processing of containers and packages.

The measures taken by the USSR State Committee for Material and Technical Supply to expand the list of products delivered in containers and packages will play an important role in the development of this advanced transportation method.

At the warehouses of the system of the USSR State Committee for Material and Technical Supply alone in the last few years the amount of transport lifting, loading-unloading and stacking equipment has increased more than fivefold. Modern highly productive mechanization equipment, such as stacking cranes for package-container and extra long freight, loaders with turning and sliding forks and slotted conveyers, account for approximately one-fourth of the entire pool of equipment. The equipment of industrial enterprises with shelves, trays and standardized containers has improved considerably. However, the need of the national economy for such types of equipment as stacking cranes with automatic and program control, electric and automatic loaders with three-sided freight processing and overall dispatch equipment is not yet fully met. Often there are difficulties with the provision of spare parts for equipment.

The accelerated development of capacities for the manufacture of mechanization and automation equipment for all types of warehouse operations envisaged for the 11th Five-Year Plan will help to solve these urgent problems.

The indicators of the level of work mechanization and of the degree of labor mechanization are used for an evaluation of the technical equipment and mechanization of warehouse operations. Despite the increase in the amount of installed equipment, the level of work mechanization, for example, at the enterprises of a number of all-Union industrial associations of the Ministry of the Machine Tool Building and Tool Industry has declined somewhat. A further analysis has shown that the coefficient of equipment utilization both in terms of time and freight capacity averages 0.3 with a standard of 0.4 to 0.45.

The efficiency of utilization of equipment can be increased through the use of various load lifting mechanisms, devices and trays, rise in the universal nature of transport and transshipment operations and mechanized processing of as big a category of freight as possible. It will be necessary to improve the combination of types and kinds of equipment and to greatly reduce intraproduction transshipments and the idle time of equipment.

The development and introduction of transport-warehouse technology of freight processing mutually coordinated for all national economic sectors will make it possible to at least reduce in half the volume of loading and unloading operations at the warehouses of the system of the USSR State Committee for Material and Technical Supply alone.

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NOTED ACADEMICIANS PROJECT SIBERIAN DEVELOPMENT

Utilization of Deposits Urged

Moscow LITERATURNAYA GAZETA in Russian No 1, 1 Jan 81 p 10

/Interview with A. A. Trofimuk, academician, first deputy chairman of the Siberian Department of the USSR Academy of Sciences, by Z. Ibragimova: "Search in Latitude 30°"; date and place not specified/

> /Text/ What will Siberia give the country during the new Five-Year Plan? How will the vast region located east of the Urals develop?
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> A. A. Trofimuk, academician, first deputy chairman of the Siberian Department of the USSR Academy of Sciences, answers the questions of a correspondent of LITERATURNAYA GAZETA.

How To Deal With Treasures

/Question/ Andrey Alekseyevich, you have often said that a geologist experiences a real sense of satisfaction only when the resources found by him are utilized and serve the good of the homeland. It seems that Siberian geologists have nothing to complain about in this respect. Most of the new cities and settlements in eastern and northern regions were established as a result of the development of certain mineral deposits, which was especially activated during the last decades. Not long ago I had occasion to take part in an expedition of the Siberian Department of the USSR Academy of Sciences to the Arctic. A geological scientist was among the members of the expedition. Each time, when in remote uninhabited places we suddenly found ourselves in an industrial center under construction, which already had its own airport and was surrounded by motor roads and where stories of stone buildings were rising over vast open spaces, our fellow traveler stated with unfailing pride: All this began from the discovery of a deposit! For people in your profession eastern regions are rewarding fields of activity, isn't that so?

/Answer/ I understand and share my colleague's feelings. It is no wonder that in the poorly developed regions of the East and the North geologists are called "employers." There all the hopes for development and all the prospects for the economy are connected with the results of a geological search. I do not wish to repeat well-known examples, but I will nevertheless recall several figures. They tell more eloquently than words about the economic significance of geology and give a clear understanding of Siberia's role in the country's national economic complex. The draft of the CPSU Central Committee for the 26th Party Congress states that the output of petroleum (including gas condensate) increased 2.1-fold and that of gas, 4.3-fold in West Siberia during the 10th Five-Year Plan. What does this mean? Every second ton and every third cubic meter of domestic petroleum and gas are now extracted in Siberia!

Siberia provides more than 90 percent of the total increase in fuel output and for petroleum it gives not only the entire all-Union increase, but compensates for the reduced output in the country's other regions. Today it is impossible to visualize our country's economy without the almost 2 billion tons of Siberian petroleum extracted during the last three five-year plans...

Fortunately, petroleum and gas in West Siberia were not only discovered promptly, but their extraction was organized very rapidly. The history of our economy demonstrates convincingly: The more quickly Siberian deposits are put into operation, the higher the return on the capital spent on their exploration and exploitation. In addition to Tyumen' petroleum and gas it is possible to mention copper and nickel ores in Talnakh and Oktyabr'skiy deposits, antimony in Yakutia and so forth. As both calculations and experience show, closing deposits temporarily is an unprofitable business. Therefore, a bitter feeling is mixed with our joy. The fact that the number of temporarily closed deposits in eastern regions is growing is alarming. Naturally, this does not increase the optimism of geologists.

/Question/ I would like to hear about the resources discovered in the zone of the Baykal-Amur Trunk Line. It is being built rapidly and is to become the core of economic development of a very big territory of our country. What, in the opinion of Siberian economists and geologists, should be developed primarily?

/Answer/ First of all, such deposits as Molodezhnoye (chrysotile-asbestos), Ozernoye and Kholodnenskoye (lead-zinc) and, of course, Udokan (copper). I must say that the situation with the famous Udokan deposit disturbs me especially. Year after year passes, but so far, to the best of my knowledge, the technique of concentrating Udokan ores has not even been developed experimentally. At the same time, the national economy experiences a tangible need for copper.

Siberian scientists are also disturbed by the fate of the Gorevka lead-zinc deposit on the Angara. Gorevka was discovered almost at the same time as Talnakh and the first conference on the development of these deposits was held jointly. However, whereas the prompt development of Talnakh led to a multiple increase in the output of metal by the Noril'sk Combine, to this day small quantities of the long-suffering ore of Gorevka are shipped across the country for experimental processing in the Caucasus. Remarkable Gorevka, where lead lies almost on the surface, was to be developed in the middle of the 1960's. But the plans for the Sredne-Yeniseyskaya Hydroelectric Power Station so complicated this task that for the second decade now there are departmental disputes and to this day there is no Sredne-Yeniseyskaya Hydroelectric Power Station and no Gorevka Mining and Concentrating Combine, whose engineering plan was accepted with the grade "excellent" a long time ago. In our opinion, the need for the most rapid development of the Gorevka deposit is obvious.

/Question/ Perhaps it makes no sense to build a hydroelectric power station? The unsound plan for the Nizhne-Obskaya Hydroelectric Power Station, which threatened a large area, on which oil derricks now stand, with flooding, was rejected at one time.

/Answer/ In this case scientists propose something else. They advise practical workers to hurry so that they have time to recover the basic reserves before the flooding and then to proceed to mine development during which reservoirs will not have a significant effect on the results of extraction.

As Siberians see it, the development of a group of deposits containing raw materials for the production of mineral fertilizers so necessary for the Siberian field should also be hastened. Geologists also had their say in this matter--it is up to the industry.

I would like to stress once again: Effectively drawing resources into the economic turnover means doing this rapidly. It is not profitable to temporarily close "treasures"--significant resources on whose exploration so many efforts and funds have been spent.

Success Loves Tenacious People

/Question/ Andrey Alekseyevich, your optimistic evaluations of the petroleum and gas bearing capacity of the structures in West and East Siberia are well known. You have always, even in the time of the second Baku, for whose discovery you were awarded the title of Hero of Socialist Labor, manifested an enviable faith in success. When most people considered the searches useless, you stubbornly insisted on continuing them. And if this directly depended on you, you continued to search. What nourishes your optimism in the evaluation of the capabilities of Siberian resources? You, of course, are familiar with other views of the prospects for the growth of petroleum output in Siberia and know about the doubts as to the ability of the natural complex to meet the growing needs of the economy.

/Answer/ You see, I believe, in general, that pessimism has no place in petroleum prospecting. Here one must be able to extract useful information even from a failure, from an empty well, as pragmatists say, and to incorporate the correction that failure gave us in our subsequent actions.

I remember how many years ago I accompanied the RSFSR minister of geology on one of his trips to West Siberia. We visited with pleasure gas deposits that had already been discovered at that time and then we found ourselves in an uncertain zone--in a petroleum prospecting region. Having found out that the explorers had not discovered anything yet, the minister began to reproach work supervisor Salmanov: "[illegible] spends millions on your wells for nothing! Is it not time to settle down and stop the prospecting?!" Credit should be given to Farman Kurbatovich--he defended his wells as much as he could. I did not contain myself either. I rushed to his help, justifying the temporary failure as an inevitable way to success, which was sure to come very soon. "Take the risk, dare," we tried to persuade the minister. "Don't close these excavations and you will be rewarded generously." Petroleum was discovered in Siberia approximately 1 year after this conversation.

Both Salmanov and I were guided by faith inspired by science. I must admit that I believed in every well that I sank during my lifetime. However, to be completely frank, I must also make the following confession. Out of 100 cases my optimism was confirmed in 20. True, in those years, during the war, this was a good result, because in the world process of petroleum prospecting only 10 out of 100 wells justified the expectations. At the same time, however, I could not but realize that such a percent of success was a verdict against the imperfection of science and our knowledge of the state of the earth's mineral resources. Of course, since then science has advanced considerably and good methods of a forecast evaluation of a territory have been developed. Today science enables us to know in advance which we are going to catch--a gudgeon or a pike--as one of my colleagues says. As before, my optimism is based only on scientific ideas. Therefore, my answer to you is as follows: Science highly evaluates the possibilities of increasing petroleum output in West Siberia and scientists are ever more convinced of the considerable resources of East Siberia.

The duty of science to the petroleum extracting industry is to develop more efficient systems of exploitation sharply increasing the bed yield coefficient, but not the cost of the process of extraction. Of great importance is also the development of new methods of petroleum and gas prospecting, to which, incidentally, the party's new program document directly draws attention.

[Question] Does science have ideas whose realization makes it possible to make a revolutionary leap in geological prospecting? Can we hope for the appearance of a system of methods of direct detection of hydrocarbon accumulations?

[Answer] There are such ideas. I have in mind methods of seismic and electric exploration in combination with geochemical methods. They have been experimentally realized by Siberian geologists. However, this is large-scale work, which requires all-Union support. Further studies of this theory and an organization of a new instrument making industry are needed. In return the development and use of these methods will accelerate and lower the cost of preparation of reserves in eastern and northern regions. If today at best 30 out of 100 wells hit the mark, the deposit, with direct methods 70 will surely hit the target.

In brief, science gives me reason to believe in the high productivity of Siberian mineral resources. However, from my point of view, some significant organizational imperfections hamper the successful development of the petroleum extracting industry. Although I have already expressed myself on this subject, I must once again say what disturbs me. I believe that there is no clear division of duties between the Ministry of Geology and the Ministry of the Petroleum Industry. The former is to ensure the prospects for the sector's development. It has the capabilities and funds to search for and find new deposits. I am convinced that the preparation of industrial reserves should be entrusted to the organizations of the Ministry of the Petroleum Industry. This ministry can perform such duties better, more cheaply and more rapidly than the Ministry of Geology, for which this burden proves to be excessive.

Why does the petroleum industry wait for geologists to bring it new deposits on a saucer with a blue border? Why does it do so little to accelerate the process of prompt development of natural resources, although it has considerable capabilities?

There is no satisfactory answer to these questions. Too many obstacles to a rapid development of new petroleum deposits have appeared. In our opinion, a certain administrative lack of coordination and departmentalism result in unnecessary work, a loss of time and a decline in development rates.

Space Control

/Question/ Andrey Alekseyevich, the development of little-inhabited eastern and northern regions raises numerous problems--economic, technical and social. Special machines adapted for harsh conditions are needed. Light transportable building structures are needed. More attention to the solution of social problems is needed. In brief, there are many problems. Which, in your opinion, should be considered the main one?

/Answer/ I am convinced that today the transport problem is of critical importance. The classic expression "Siberia's development is space control" remains just as urgent as 50 years ago. After all, we are ever more resolutely going to the East and the North.

The gas industry will develop rapidly, especially in northern regions where there are hardly any roads. In general, the coefficient of Siberia's transport development is low. It is less than one-fourth of the average in the RSFSR and one-ninth or one-eleventh of that in the regions of continuous development--the Central, Central-Chernozem and Northern Caucasus regions. The rates of increase in motor roads are lower in Siberia. Please note that to this day there is no latitudinal motor road connecting Siberia's regions with each other as well as with the Urals and the country's European part. Not to mention the North and the Arctic regions, where there is a density of 0.1 to 0.2 people per square kilometer!

Very big gas deposits were discovered in the north of the West Siberian plain. They are so big that they attract, despite the remoteness, lack of roads and complexity of development. These deposits are so rich that even under difficult conditions they make it possible to extract gas very efficiently, at a great profit. In my opinion, however, this fact makes the transport problem a top-priority one. I consider it my duty to say that it is necessary to immediately bring the Salekhard-Urengoy railroad with a continuation to Noril'sk up to an operational level. I believe that this is the most important enterprise of the forthcoming five-year plan.

Is it necessary to talk about the need for permanent motor roads? To me this is obvious. However, I would like to draw special attention to the new types of air transport, in particular the helicopter and dirigible combinations, whose ideas are being studied in our country. These studies should be accelerated, because, judging from preliminary reports, vehicles as suitable as possible for the East and the North--reliable, load-lifting and maneuverable--are obtained from this. Experts say that the modern helicopter uses 85 percent of its force on keeping the vehicle in the air and only 15 percent on the load for whose transportation it has been developed. The same experts say that in case of a dirigible and helicopter combination the reverse will be true: 85 percent of the force will be used to transport a useful load and only 15 percent on the flight itself.

/Question/ Air cushion facilities have proved their value. However, large-scale industry is not yet truly interested in them.

/Answer/ Yes, everything is still limited to the activity of semiprimitive shops. They develop experimental models, which come through excellently and show a high efficiency, but the matter ends at the experimental stage.

Land, water and air--all the ways to the mineral resources in which our state is so interested--should be utilized with the maximum efficiency.

/Question/ Thus, transport is both a knotty and a complex problem. Do you share the opinion of many Siberians that the entire country should help eastern and northern regions in its solution? Sometimes it seems to me that Siberians put a special meaning in these words...

/Answer/ Perhaps... I remember the war years. The war found me in the Ural-Volga area during the height of the search for the second Baku. We gave the front the best tractors and, in general, all the best equipment we had. We had to accomplish our strategic task--to give the country a new petroleum reservoir--with the same equipment that proved to be unsuitable for the front, that is, tractors in need of repair and, essentially, deteriorated pipes... Then Baku and Groznyy petroleum workers gave us great help. They brought from the south everything that was useful for prospecting and drilling. They supported us materially and strengthened us morally. We felt the support of the entire country.

I remember this not by accident. Now there are different times and different scales. However, even in its peaceful offensive, as the saying goes, on the fronts of the five-year plan the country pins very great hopes on Siberia. In turn Siberia has the right to count on the support of the entire country in the solution of statewide problems. All the Soviet people will benefit from this.

"Sibir" Scientific Program Discussed

Moscow PRAVDA in Russian 15 Feb 81 p 3

/Article by V. Koptyug, academician, chairman of the Siberian Department of the USSR Academy of Sciences, Novosibirsk: "Siberian Scale"/

> /Text/ The main problem now facing all the spheres of management is how to accelerate the transfer of the economy to an intensive way of development. This can be done only on the basis of the achievements of scientific and technical progress. For the country's eastern regions the problem of intensification is especially important, because the economic potential will have to be increased there at higher rates than the average throughout the country and the redistribution of labor resources in favor of Siberia is difficult. Therefore, it is necessary with special efficiency and on a large scale to develop science and technology, to raise the educational level of personnel, to enlist science in the solution of fundamental practical problems and to realize its achievements in this region.

The Siberian Department of the USSR Academy of Sciences in cooperation with the Siberian departments of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin and the USSR Academy of Medical Sciences, organizations of ministries and departments and higher educational institutions in the region has formed a large-scale overall long-term scientific program called "Sibir'." It includes 30 scientific object programs devoted to the study and utilization of fuel-power and mineral-raw material resources, development of territorial production complexes, protection of the environment and complex technical and technological problems. Its development and fulfillment have become some of the most important tasks of the Siberian Department of the USSR Academy of Sciences and the core of the combined efforts of academic, sectorial and university science. More than 230 organizations now participate in the realization of this program.

The goals of the program have been intensified in the course of work. If at first it was directed mainly toward the realization of the results of performed studies, gradually it became clear what fundamental and applied research was additionally needed to solve a specific major problem. In accordance with this our department develops or expands research, including the establishment of new institutions. For example, the Institute of Chemistry and Chemical Technology in Krasnoyarsk was organized for the purpose of providing a scientific base for the development of new industrial processes for nonferrous metallurgy, coal chemistry and wood chemistry. The Institute of Mining of the North was established in Yakutsk and the basis for an overall institute, whose task is to contribute to the solution of mining-geological and chemical-ecological problems of the region of the Kuznetsk Coal Basin and, in part, of the Kansko-Achinsk Fuel and Power Complex, was laid down in Kemerovo.

We consider the contribution of our scientists, especially economists, to the determination of the strategy of Siberia's development within the framework of the all-Union national economic complex for the 11th Five-Year Plan and a more distant future one of the important results of work based on the program. These problems were thoroughly discussed at the all-Union conference held in Novosibirsk in the summer of 1980, which adopted the appropriate recommendations.

A great deal is written about the basic trends and problems in Siberia's economic and social development. I would like to draw attention to what was and is being done by scientists to solve them and to discuss the developments, whose fruits Siberian science can offer right now.

I will begin with problems connected with an increase in the extraction and processing of fuel and mineral raw materials. The draft of Basic Trends draws attention to the development of advanced methods of geophysical and geochemical investigations. On the basis of modern achievements of physics, chemistry, mathematics and instrument making they make it possible to "glance" into the earth's interior.

Petroleum and gas now account for a significant part of the funds invested in the search for mineral resources. In the regions into which prospectors advance one must deal with ever more complex geological conditions and with the specific nature of deposits. The Siberian Department of the USSR Academy of Sciences develops vibroseismic methods of prospecting for the study of large areas and considerable depths. Models of equipment for the collection and processing by means of computers of a large volume of obtained data were developed jointly with a group of ministries. In combination with electric exploration these methods open the way for a direct detection of petroleum deposits, which will make it possible to greatly reduce the volumes of exploratory drilling.

The achievements of geochemistry open up great possibilities for an increase in the efficiency of prospecting evaluation work. For example, the study of leakage fluxes of various chemical elements in friable deposits with the processing of results on computers makes it possible to evaluate the presence of metal in large territories rapidly and with sufficient reliability, preventing expenditures on the study of clearly unpromising regions. The method proposed by Siberian geochemists reduced the expenditures on the search for optic calcite deposits to one-fourth and greatly decreased the time and expenditures on the detection of sections promising for phosphoric and complex ores in the zone of the Baykal-Amur Trunk Line.

Improvement in the technique of extraction of mineral resources occupies a prominent place among the program projects. Well drilling, massif demolition and the loading and transportation of the mountain mass are the most labor intensive processes in their extraction. The efforts of the Institute of Mining are directed toward the development of efficient equipment for the mechanization of these processes. For example, on the basis of fundamental research new mechanisms--pneumatic percussion reamers--have appeared in the last few years. They make it possible to obtain wells with a diameter of more than 30 cm. Tests at the Noril'sk Mining and Metallurgical Combine have shown that their use can increase labor productivity fourfold to fivefold. The vibration loading and delivery units developed at the institute also raise labor productivity several times.

I would also like to mention the work of the scientists at the young Institute of Mining of the North in Yakutsk. The original technique of extracting finely dispersed gold from clay, which previously was almost unattainable, belongs to them.

The use of computers and the mathematical modeling of studied processes are some of the powerful levers in scientific and technical progress. In the "Sibir'" program there are many problems, whose solution is based on achievements in this area. For example, the Siberian Power Institute with the participation of other organizations has developed and continues to improve mathematical models for the optimization of control of large power systems. On this basis the first stage of the "fuel and power complex" subsystem was built and adopted by the USSR State Planning Committee. The effect from the operation of this system is estimated at 100 million rubles annually.

Mathematical modeling helped to develop a fundamentally new technology of industrial catalytic processes under nonstationary conditions. On the basis of the theory of movement of the heat front in a reactor with a fixed-bed catalyst a highly efficient and economical method of detoxication and utilization of sulfur contained in the waste gases of nonferrous metallurgy enterprises with the production of sulfuric acid and elementary sulfur was developed. A pilot unit for the production of sulfuric acid from waste gases at the Noril'sk Mining and Metallurgical Combine should be put into operation this year.

For the extractive industry mining scientists have proposed packages of applied programs making it possible by means of computers to automate planning, to find rational schemes and to determine the order of open and underground operations. The programs are used during the planning of the open pits of coal complexes and the reconstruction of a number of mines.

Active cooperation in the area of intensification of agricultural production has been organized with the Siberian Department of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin. New varieties and hybrids of wheat, rye, corn, soybeans and sugar beets with an increased yield and resistance have been developed with the use of methods of chemical and radiation effect. It has also been established that, affecting the growth and development of plants by means of phytohormonal preparations, it is possible to obtain a significant increase in the harvest with the same varieties and on the same areas. Such results have been obtained in field tests on corn, potatoes and tomatoes. The microbiological industry is now mastering the technique of obtaining a new growth preparation. A new pedigree group of meat and wool sheep producing 30 to 50 percent more wool and 15 to 20 percent more meat than the initial breeds has been developed.

The importance of reducing losses of agricultural products during storage is well known. Scientists at the Institute of Nuclear Physics together with sectorial organizations have shown that in many cases radiation techniques with the use of electron accelerators produced by the institute can be used for the disinfection and preservation of grain and potatoes.

Prolonging the life of machines operating under harsh climatic conditions represents a vast potential for the saving of state funds. Scientists at the Yakutsk affiliate have made a considerable contribution to this.

Of course, what has been enumerated by no means exhausts what was and is being done according to the "Sibir'" program. On its basis scientific research on the object subprograms "petroleum and gas in West and East Siberia," "coal of the Kuznetsk Basin," "Siberia's ore gold," "precious and rare metals, copper and nickel in Krasnoyarskiy Kray," "economic development of the zone of the Baykal-Amur Trunk Line" and so forth has been included in the programs of a number of sectors for the 11th Five-Year Plan. At the same time, such important problems as "man's health in Siberia," "utilization of peat resources" and "building materials" have not yet been reflected in the program. Some ministries and departments suggest that other important subjects be also included in it. Thus, the program continues to enrich itself and, at the same time, becomes more complicated. Its management now becomes a complex problem.

Experience has clearly demonstrated the efficiency of the object program approach to the organization of scientific research and the utilization of its results. The effect could have been increased considerably if the program, which in its design and content exceeds the limits of the Siberian Department of the USSR Academy of Sciences, had received a statewide status and had been organically included in all-Union plans. In this respect we pin great hopes on the USSR State Committee for Science and Technology.

Its formation would be inconceivable without the vast scientific reserve--the result of long-term fundamental research by the department's scientists. The sagacious decision of the party and the government on the need to develop academic science in the country's eastern regions is manifested with special force here. Fundamental research must continue to remain the cornerstone for the Siberian Department. This should be taken into consideration in the plans for its financing for the 11th Five-Year Plan. The share of economic contract work of an applied trend in the total research volume reached 30 percent. Its further increase is dangerous--we can cut off the roots of the tree of science in Siberia. We must also take into consideration the fact that, along with strengthening the department's existing scientific institutions, there is an urgent need to establish new academic subdivisions in Tyumen', Omsk, the Kuznetsk Coal Basin, Altayskiy Kray and other "hot" spots of Siberia's development. The serious lag of the pilot base is a cause for concern.

It is no less important for Siberia to also expand the network of sectorial and intersectorial research and planning-design organizations and to increase the region's educational potential. The outstripping rates of development of Siberia's productive forces require an appropriate increase in capital investments in science and education and this should be envisaged in the programs of the five-year plan.

Scientists at the Siberian Department of the USSR Academy of Sciences continue their active search for and testing of fruitful forms of interaction of science and practice. The department is engaged in work on overall programs with 20 ministries and departments and develops direct contacts with associations and enterprises in Novosibirsk, Tomsk, Irkutsk and other cities in the region. A complex of sectorial scientific research institutes and design bureaus has appeared around akademgorodok. Many of them have become involved in the development of the department's studies for the purpose of utilizing their results in the national economy.

In the improvement in the forms of organization and management of scientific research, cooperation of academic, sectorial and university science and its interaction with practice there are still many hidden potentials. Their maximum utilization is the primary task of scientists and engineering and technical personnel.

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REGIONAL DEVELOPMENT

FORMATION, DEVELOPMENT OF TERRITORIAL PRODUCTION COMPLEXES

Moscow EKONOMICHESKIYE NAUKI in Russian No 3, Mar 81 pp 14-20

[Article by Candidate of Economic Sciences Docent A. Popov (Leningrad): "The Formation and Development of Territorial Production Complexes Under the Conditions of Mature Socialis

[Text] The implementation of the directives of the 25th CPSU Congress and the plans of the 10th Five-Year Plan was marked by new achievements of our country in the building of the economy. The scale of production grew, the economic relations in our economy became more complicated, profound structural changes occurred in the distribution of the productive forces. All this requires the further improvement of the management of the national economy. The spatial organization of production is an important direction of the improvement of the entire economic mechanism. Speaking about the prospects of the socialist economic system, Comrade L. I. Brezhnev in a speech at the November (1979) CPSU Central Committee Plenum noted: "During the next five-year plan it is necessary... to improve the established sectorial and territorial relations, to identify the links in which at the cost of the least expenditures it is possible to obtain the greatest and a quick impact."[1] Hence stems the need for the further study of the territorial organization of production, particularly such basic problems as the determination of the scientific principles of the arrangement of the national economy with allowance made for economic and geographic factors; the improvement of the planning of production with a breakdown by territories; the establishment of the efficiency of regional subsystems. These questions and the questions similar to them in nature require for their successful solution a uniform approach which can be backed within the framework of the study of territorial production complexes, especially as the latter in conformity with party decisions will undergo further development during the 1980's.

The methodologically sound study of the objective laws of the formation of territorial production complexes requires a reproductive approach. In economic literature the study of reproductive processes, as a rule, is conducted on two levels of the economic hierarchy: first, on the microstructural level, at the level of the individual enterprise (or association); second, on the macrostructural level, on the level of the entire national economy. The former of these levels expresses individual reproduction, the latter expresses social reproduction. Individual and social reproduction are in dialectic unity as the individual and the general. They interact at the present level of the socialization of production through regional reproduction.

The characterization of the territorial organization of production from the standpoint of the reproductive approach makes it possible to study as thoroughly as possible the economy of a region. Such an approach provides the best idea about the territorial production complex, its spatial organization, the use of manpower and natural resources and the interdependence of the economic and social aspects of regional development. In examining the territorial production complex as a reproductive subsystem, we should turn to the territorial peculiarities of the reproduction of manpower and establish the volumes and proportions of the output of products in value and physical terms, the directions and flows of its movement, the sources of capital investments, the balance of manpower resources, the balance of material expenditures, the production of the national income, the real monetary income, that is, everything that characterizes the real and potential means of the formation and functioning of territorial production economic systems as relatively self-reproducing components of the national economy of the country.[2]

Regional production combines the sectorial ("vertical") and territorial ("horizontal") principles of the organization of production. The territorial production complex functions as an integrity only in the process of the interaction of its individual elements during reproduction and is perceived as an integral system, as an integral structural systems formation only as a result of balanced operation.

From the standpoint of the reproductive approach the territorial production complex, on the one hand, forms an economic system which is characterized by the relative independence of the reproductive cycle. The reproductive process at this level acquires a relative self-contained nature. On the other hand, the formation of the territorial production complex takes place within the unified national economic complex as a component of the latter, the functioning of which is subordinate to the general national economic tasks.

In this situation the improvement of the territorial mechanism requires the combined solution of intersectorial and territorial problems and constant reliance on the planned development of the national economy of the country with allowance made for the economic potentials and resources of each economic region and republic. "The consolidation of the economic potentials and resources of all the republics," Comrade L. I. Brezhnev said, "is expediting the development of each of them--both the smallest and the largest. Unionwide management and planning have made it possible to approach efficiently the distribution of productive forces, have provided latitude for economic maneuvering and have made it possible to intensify cooperation and specialization, in case of which the overall advantage is many times greater than the simple arthimetic sum of the components--the efforts of each republic, rayon and oblast."[3]

The singling out and study of the leading phase of expanded reproduction--the process of production, which is then examined in interrelationship with the other phases of reproduction--are of decisive importance when forming the territorial production complex. The phase of production as a subsystem of the entire reproductive process is not only the decisive, but also the most complicated phase in the formation of intersectorial and territorial production complexes. This is explained by the fact that two interconnected processes exist here. On the one hand, there is the sectorial organization of production, when the creation of use values is accomplished according to the technological principle, by forming various works in the form of intersectorial regional complexes; on the other, there is the territorial organization of production, when the creation of use values is accomplished according to the territorial principle, by forming local works in the form of territorial production subsystems.

By using the reproductive approach, which is based on the Marxist-Leninist theory of expanded reproduction, as well as the theory of the planned development of the national economy, it is possible to formulate the most important underlying theoretical premises of the formation of the territorial production complex. First, there is the efficient combination of the sectorial and territorial division of labor. Second, there is the consideration of the reproductive aspects in the process of their formation; in other words, the creation of territorial production complexes should be carried out with allowance made for the establishment of rational intersectorial and intrasectorial proportions, production economic relations, the flows and directions of the exchange of the results of economic operations, the better organization of the reproduction of manpower and so on. Third, there is the territorial concentration and specialization of production, that is, the formation of territorial production complexes is accompanied by the intensification of territorial concentration and the increase of the level of specialization, which leads to the acceleration of the development of the socialization of production and to the emergence on this basis of fundamentally integral subsystems. Fourth, the completeness of the development of production with a breakdown by territories, which makes it possible to carry out the most complete processing of raw materials and materials and to ensure the maximum efficiency, is achieved. Fifth, the problem of the optimization of the territorial organization of production, the establishment on this basis of close interrelations between related sectors and works, their coordination and balancing and the increase of the production volumes of the leading sector to the levels which ensure the minimum expenditures for its output and delivery to the consumer, is solved.

The formation of territorial production complexes is inseparably connected with the process of the intensification of the socialization of production, its concentration and specialization on the basis of the intensification of the division of labor. The latter leads to the breakup of production with a breakdown by sectors and territories and at the same time to the intensification of integration processes, to the appearance of new forms of the sectorial and territorial organization of labor. Such a situation results from the fact that the division of labor functions as a form, on the one hand, of the dissociation of producers and, on the other, of the strengthening of the contact and interdependence as a result of the developing exchange of the results of production activity. Exchange, as K. Marx wrote, "does not create differences between the spheres of production, but establishes contact between spheres which are already different and transforms them into sectors of aggregate social production, which are more or less dependent on each other."[4]

When speaking about the socialization of production, it is necessary, of course, to bear in mind that not every aggregation of works in a specific economic region acts as a form of the manifestation of socialization. The location on a compact territory of isolated enterprises which are not united by reproductive interrelations does not increase the level of socialization and cannot be regarded as an effective means of the formation of territorial production complexes.

The political economic /definition of the territorial production complex seems to us to be the following: it is the form of the socialization of production under the conditions of mature socialism, which appears as an aggregate of enterprises of different sectors, which was formed as a result of the combination of the sectorial and territorial division of labor; develops on the basis of the leading specialization of one or several sectors; consumes the available resources with their most complete processing prior to the output of the finished product; uses a common production and social infrastructure; functions in the system of social reproduction and achieves on this basis the maximum economic impact/ /in italics/. The effective functioning of territorial production complexes presumes, of course, the appropriate planned management.

At present there does not exist as yet the organizational formalization of the established functional relations at the level of intersectorial and territorial production regional complexes, there are no unified organs of management of these territorial production subdivisions. But this should not serve as an obstacle in the active comprehensive development of production with a breakdown by territories. The missing organizational forms can to a great extent be offset by economic methods, which ensure the organization of concerted actions among interrelated links. This makes it possible to strive for the balanced development of the economy with a breakdown by territories, by using the system of planning and material and technical supply and the intersectorial balances of the output and distribution of products. The organizational formalization of territorial formations for their transformation into socially combined, scientifically managed bodies should be developed at the same time. The party Central Committee is directing the attention of the planning and economic organs of the country toward this. During the 11th Five-Year Plan the task is arising: to increase the effectiveness of territorial planning and its role in the development of regions; to improve the planning and management of territorial production complexes; to elaborate uniform economic and legal principles of the interdepartmental management of territorial production complexes. Within the existing territorial organization of production this can be accomplished, first, by extending the functions of territorial management organs in the disposal of the funds of social reproduction; second, by means of the development of the forms of the coordination and the increase of the economic role of territorial management organs; third, by means of the adoption of such forms of the distribution of the net product, which enable regions to shift assets freely, ensuring the normal balanced development of territorial production complexes. The task is, as is noted in the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, "to increase the level of planning and management, to bring them in line with the requirements of the present stage--the stage of mature socialism."[5]

The study of the objective laws of the formation and development of the organization of the economy with a breakdown by territories is of great theoretical and practical importance. The solution of many practical problems of the planned formation and development of productive forces, as well as of the social processes which make it possible to improve the existing methods of the territorial organization of the economy of the country, depends on the level of elaboration of the general methodological problems of the development of production on a territorial basis. The identification of the qualitative and quantitative relationships between the territorial and sectorial development of the national economy makes it possible to reveal additional sources of the increase of the efficiency of social production, and this is unquestionably of enormous practical importance for the national economy of the country.

The study of the objective laws of the formation and development of territorial production complexes gives rise to the need to turn to the peculiarities of the effect of economic laws with a breakdown by territories. Speaking at the 15th Komsomol Congress, Comrade L. I. Brezhnev said: "The economic policy of the party... is aimed at placing the management of the national economy on a scientific basis, at giving the final say to the economic laws of socialism, at skillfully using the system of moral and material stimuli."[6] Economic laws have, as is known, a complicated, at times contradictory form of appearance. The peculiarities of regional reproduction presume specific forms of the appearance and certain modifications of the mechanism of the effect of economic laws on the regional level. The special conditions of the functioning of the national economy of a region, which arise for a number of reasons, have an effect: the degree of the socialization of production is different at different levels of the national economic hierarchy; the reproductive cycle of regional subsystems is relatively isolated; there are differences in the development of productive forces with a breakdown by territories; the result of production, which forms under the influence of the specific natural, economic and social factors of the development of the national economy, is different.

Of course, the socialization of production has the strongest influence on the effect of economic laws with a breakdown by territories. The development of socialization, on the one hand, strengthens the intraregional interrelations and interdependences and, on the other, "erodes" them and destroys the framework of the relative self-containment of the reproductive cycle. There is a certain dependence in the effect of these directly opposed phenomena. The strengthening of interrelations and interdependences, as the level of socialization increases, occurs in the hierarchical subordination of the regional subsystems of social production, "from the top down." At the lower levels of the national economic hierarchy of the regional economy the economic interrelations and interdependences become closer and more stable owing to the higher level of the cooperation of labor. And on the other hand, with the transition from one level of social production to another, higher level the closeness of these relations in regional reproduction lessens, giving rise to the specific conditions of the functioning of the regional subsystems at different levels of the national economic hierarchy.

It is necessary, in our opinion, to distinguish two aspects of the study of the influence of economic laws on the socio-economic processes of the territorial organization of production. First, this influence affects the /formation/ /in italics/ of regional subsystems. On this level the study makes it possible to elaborate methodological principles of the efficient distribution of productive forces over the economic regions, the improvement of the structure of the economy of the formed industrial and agro-industrial centers, the complete utilization of natural resources and the development on this basis of plans and goal programs of the formation of territorial production complexes. Second, the economic laws influence the /functioning/ /in italics/ of regional subsystems. The study in this direction includes a group of problems which are connected with the functioning of the regional subsystems, which have been formed or are at the stage of formation. Here it is possible to establish the organizational principles of the functioning of the regional economy, to identify the peculiarities of the economic mechanism in its territorial aspect, to elaborate the theoretical principles of the economic management of the regional economy, to find the most effective and rational forms of the economic relations of the regional subsystems and on this basis to create the conditions for the more effective solution of large-scale sectorial and territorial national economic problems during the period of mature socialism.

In economic and economic geography literature considerable attention is devoted to the first direction of research, that is, to the identification of the influence of economic laws on the formation of the territorial organization of production. The authors doing work in this direction have advanced several approaches to the methodological substantiation of the formation of regional subsystems. Some suggest that the process of the formation and development of the national economy with a breakdown by territories is based on some single economic law (moreover, such a role is ascribed to different laws: the laws of the social division of labor, planned development, the economy of time, the increasing efficiency of social production and so on);[7] others suggest that not one, but several economic laws are in force here;[8] a third group advances as the decisive law one of the economic laws, which is modified or manifested in the area of location as several economic laws;[9] a fourth group defines each objective law of the location of production by several economic laws.[10]

We believe that it is impossible to examine the process of the location of production separately from other economic phenomena; therefore, there are no grounds to advance as the basic law in the territorial location of production any one or even several separate economic laws. The study of the economic laws of the location of production should be conducted from the standpoint of a systems approach, which presumes the examination of economic laws in their interrelationship and interdependence. The system of economic laws, like any set, is divided into components, the study and analysis of which make it possible to establish the influence of individual laws on different spheres or processes of social life, particularly the territorial location of production and the development of territorial production complexes.

The manifestation of economic laws depends on the conditions of the social reproduction of the region, on what characterizes its relatively isolated reproductive cycle. This first of all concerns the analysis of the effect of the main economic law of socialism. An individual economic region cannot, as a rule, completely meet its own needs which are dictated by the main economic law. This once again attests that the study of regional economic problems is inconceivable without consideration of both the entire national economic complex and the simultaneous and interrelated effect of the entire system of economic laws within the given region.

A systems approach is also needed when studying the economic laws, on the basis of which the regional subsystems function. They apply not only to the national economy of the country as a whole, but also to its structural subdivisions of various ranks.

It is necessary to get to know the economic laws of the functioning of territorial subsystems from the standpoint of the clarification of the essence of the economic processes of the territorial organization of production. By their structure and hierarchical principle of construction they operate on two levels: on the one hand, the territorial level (that is, the organization of production is carried out horizontally) and, on the other, the sectorial level (the building of the national economy is carried out according to a multistage scheme, vertically).

We made an attempt to study the economic laws, on the basis of which the regional subsystems function.

The subsystems of a reproductive nature include the economic processes which are connected with the reproduction of manpower, with the creation and use of the gross national product, with the establishment of exchange processes in economic operations, with the use of capital investments and so on. These economic processes take place under the influence of specific economic laws, and in all cases it is a matter of the effect not of one, but of several laws, among which, as a rule, one performs the role of the decisive law: the degree of influence of the different laws on this process might not be the same.

The economic laws, which act as the decisive laws, are interconnected along the line of interaction, or coordination. They express the most essential relations of the territorial organization of production. It is possible to group with them the main economic law of socialism, the laws of the planned, proportionate development of the national economy, the social division of labor, socialist accumulation, the increasing efficiency of social production, the concentration of socialist production and others. It should be noted that the main economic law of socialism, owing to its specific nature, in the end always retains the decisive role.

In practical activity the interaction of the economic laws or their coordination horizontally is observed, in particular, in the comprehensive approach to the solution of certain problems or others of the development of the national economy. The comprehensive approach is used when compiling the intersectorial balances of the output and distribution of the production of the economic region. Such balances have been elaborated by the problem laboratory of regional economic research for the Northwestern Economic Region and the Leningrad Region. During their compilation the comprehensive approach was manifested in the reflection, first, of the interrelationship of the different sectors of the national economy, which constitute the unity of the region; second, the combination of the processes of the development of the national economy with the dynamics of the population and the manpower resources; third, the coordination of the prospects of the economic and social development of the region.

The economic laws, which perform the functions of the decisive laws, are manifested in the particular laws of the corresponding spheres, that is, the most essential relations of the territorial organization of production are expressed in concrete terms in the less essential relations. The interrelationship of the more general and particular economic laws of the given sphere is realized vertically, along the line of subordination, as a result of which subsystems of economic laws are formed. The law of socialist accumulation, for example, is manifested in such particular objective laws as the correlation between accumulation and consumption, the equalization of the levels of economic development of different regions of the country, the assurance of a high rate of development of the sectors of the national economy. The law of the concentration of production is expressed in concrete terms in the particular objective laws of the advantage of large enterprises over small ones and in the reduction of the production costs per unit of output. The law of the steady increase of labor productivity is manifested in particular objective laws, among which are the leading growth rate of labor productivity as compared with the increase of wages, the change of the ratio of the expenditures of living and embodied labor, which is included in a commodity, and so on.

The intensified study of the problems of the effect and use of economic laws, particularly in the processes of the functioning and development of territorial production complexes, is of the greatest importance for the achievement of economic gains and for the solution of the problems facing our economy. Such a study is also conducive to the implementation of measures which are aimed at overcoming departmental isolation and at the proper combination of sectorial and territorial management. One of the most important problems to be solved during the commenced five-year plan is to improve the coordination of the activity of central, sectorial and local management organs in the interests of the effective solution of the key problems of the development of the national economy.

FOOTNOTES

1. L. I. Brezhnev, "Rech' na Plenume Tsentral'nogo Komiteta KPSS 27 noyabrya 1979 goda. Postanovleniye Plenuma TsK KPSS" /Speech at the CPSU Central Committee Plenum on 27 November 1979. Decree of the CPSU Central Committee Plenum/, Moscow, 1979, p 21.

2. See V. Ya. Feodoritov, "Some Peculiarities of Regional Interrelations," "Ispol'zovaniye mezhotraslevykh rezervov ekonomicheskogo rayona" /The Use of the Intersectorial Reserves of the Economic Region/, Leningrad, 1973, p 36.

3. L. I. Brezhnev, "Ob osnovnykh voprosakh ekonomicheskoy politiki KPSS na sovremennom etape" /On the Main Questions of the Economic Policy of the CPSU at the Present Stage/, Vol 2, Moscow, 1975, p 265.

4. K. Marx and F. Engels, "Soch." /Works/, 2d edition, Vol 23, p 364.

5. "O dal'neyshem sovershenstvovanii khozyaystvennogo mekhanizma i zadachakh partiynykh i gosudarstvennykh organov. Postanovleniye TsK KPSS ot 12 iyulya 1979 goda. Ob uluchshenii planirovaniya i usilenii vozdeystviya khozyaystvennogo mekhanizma na povysheniye effektivnosti proizvodstva i kachestva paboty. Postanovleniye TsK KPSS i Soveta Ministrov SSSR ot 12 iyulya 1979 goda" /On the Further Improvement of the Economic Mechanism and the Tasks of Party and State Organs. Decree of the CSPU Central Committee of 12 July 1979. On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality. Decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979/, Moscow, 1979, p 7.

6. L. I. Brezhnev, "Leninskim kursom" /By the Leninist Course/, Vol 1, Moscow, 1970, p 383.

7. See A. I. Demenev, "Effektivnost' spetsializatsii i kompleksnogo razvitiya promyshlennikh uzlov" /The Effectiveness of the Specialization and Comprehensive Development of Industrial Centers/, Sverdlovsk, 1970, p 20; Yu. G. Saushkin, "Ekonomicheskaya geografiya: istoriya, teoriya, praktika" /Economic Geography: The History, Theory and Practice/, Moscow, 1973, p 390; A. Ya. Korsakov, "Ekonomicheskiye problemy territorial'nogo razdeleniya truda v usloviyakh nauchno-tekhnicheskoy revolyutsii" /Economic Problems of the Territorial Division of Labor Under the Conditions of the Scientific and Technical Revolution/, Sverdlovsk, 1975, p 44.

8. See N. I. Shrag, "Promyshlennyye kompleksy (teoreticheskiye ocherki)" [Industrial Complexes (Theoretical Studies)], Moscow, 1969, p 55.

9. See A. Ye. Probst, "Effektivnost' territorial'noy organizatsii proizvodstva" [The Effectiveness of the Territorial Organization of Production], Moscow, 1965, pp 23-25; N. T. Agafonov, "Osnovnyye problemy formirovaniya promyshlennykh kompleksov v vostochnykh rayonakh SSSR" [The Main Problems of the Formation of Industrial Complexes in the Eastern Regions of the USSR], Leningrad, 1970, p 17.

10. See V. V. Kistanov, "Kompleksnoye razvitiye i spetsializatsiya ekonomicheskikh rayonov SSSR" [The Comprehensive Development and Specialization of the Economic Regions of the USSR], Moscow, 1968, p 6.

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INTRODUCTION OF NEW TECHNOLOGY

USE OF PRICE TO STIMULATE NEW TECHNOLOGY EXAMINED

Efficiency, Price

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 2, Feb 81 pp 59-65

[Article by Candidate of Economic Sciences L. Shevchenko: "The Efficiency, Price and Stimulation of New Technology"]

[Text] A greater efficiency of new types of technology as compared with the types being replaced is a necessary condition of the increase of the efficiency of scientific and technical progress and all social production. In the plans of the development of the national economy this condition should be realized by a set of specific technical and economic indicators and standards. However, so far in the plans on new technology and capital construction there are no indicators (standards) of the required increase of the efficiency of new types of technology as compared with the base types. The task of increasing the efficiency of new technology so far has lacked quantitative definiteness, specificity.

When it is a question of the rating of the efficiency of new types of technology, the Method of Determining the Economic Efficiency of the Use in the National Economy of New Technology, Inventions and Rationalization Proposals (1977) should first of all be used as a guide. The evaluation of the expedience of developing and introducing new technology is an evaluation of the degree of increase of the efficiency of new technology as compared with the base technology. The solution of this problem in conformity with the Method of Determining the Economic Efficiency is accomplished on the basis of the annual economic impact, which is determined by comparing the adjusted expenditures with respect to the base and new technology. A positive value of the difference of the adjusted expenditures, the availability of the total of the annual economic impact or the satisfaction of the inequality: the coefficient of the effectiveness of the capital investments in productive capital (E) should be greater than the standard coefficient of effectiveness (E_H)-$E > E_H$, is necessary for a positive solution of this problem. But no matter how we express the condition of the increase of efficiency of new technology as compared with the base technology, on the basis of the Method of Determining the Economic Efficiency it is impossible to obtain an answer to the question of the necessary extent (degree) of increase of the efficiency and to determine what total of the annual economic impact should be considered adequate, or how much greater the coefficient of the effectiveness of capital investments should be than the standard coefficient, so that it would be possible to infer the great efficiency of this type of technology. The Method of Determining the Economic Efficiency does not enable us to elaborate a plan indicator of the need to increase the efficiency of new technology as compared with the base technology. In our opinion, the lack of such an indicator is a serious omission in the planning of the national economy.

The rating of the efficiency of new technology does not end with the calculations recommended by the Method of Determining the Economic Efficiency. It is as if continued in the Method of Determining the Wholesale Prices for New Products for Production Engineering Purposes (1974),[1] in which the economic impact serves as the criterion of the efficiency of new technology and the economic substantiation of its price. For the purpose of checking the validity of the level of prices for new types of products it is necessary to calculate and compare the specific values of the prices (per unit of the main technical and economic parameters) for the new product and the product being replaced. Practical experience has shown that the comparison of the specific prices does not make it possible to estimate unambiguously the level of efficiency of new technology. Moreover, a quantitative measure of the required decrease of the specific prices has not been set.

In recent years the decrease of prices per unit of effective impact has been the main direction of the estimation of the increase of the efficiency of new technology when determining the level of its price. The verbal expression of this condition has gained a firm basis, but its concrete realization so far has not found practical embodiment, primarily for two reasons: first, there is no uniform acknowledged (adopted by a method or prodecural instruction) unit of the increase of the effective impact and, second, there is no accepted prevailing standard of the decrease of expenditures per unit of effective impact. Therefore, nothing has changed in either the procedural or the practical aspects of the setting of prices for new technology. The specific prices per unit of productivity (capacity) continue to dominate in the assessment of the acceptability of the level of the price.

The assurance of the monitoring of the level of efficiency of new technology by means of the price requires the elaboration of an indicator of the increase of the effective impact and the necessary degree of reduction of the expenditures (price) per unit of this increase. The ratio of the upper limit of the price ($\text{Ц}_{\text{вп}}$) for the new type of product and the price for the base type ($\text{Ц}_{\text{б}}$) can serve as the indicator of the increase of the effective impact of new technology as compared with the base technology in pricing. The ratio reflects the overall change of the consumer properties of the new technology as compared with the base technology and at the same time shows the maximum possible increase of the price for the new technology as compared with the base technology depending on the level of change of the consumer properties. The indicator derived by us of the increase of the effective impact was called the integral coefficient of interchangeability ($\alpha_{\text{н}}$),[2] since by means of it the expenditures on the type of technology being replaced can be reduced to a comparable level of the consumer properties of the new technology. It can be used for the estimation of the acceptability of the level of the price for the new type of technology from the point of view of the meeting of the conditions of the increase of its efficiency as compared with the base technology.

The condition of the increase of the efficiency of new types of technology as compared with the types being replaced, or the condition of the reduction of the prices per unit of effective impact can be written as:

$$\text{Ц}_2 < \text{Ц}_{\text{б}} \cdot \alpha_{\text{н}}, \qquad (1)$$

where $Ц_2$ is the price of the new type of technology; $Ц_б$ is the price of the base item; $\alpha_и$ is the integral coefficient of interchangeability (the coefficient of the increase of the effective impact). This inequality means that the expenditures (price), which a unit of the increase of the consumer properties (effective impact) of the new technology accounts for, should be less than the expenditures (price) on the development of the level of the consumer properties of the technology being replaced.

The condition written by us of the increase of the efficiency of new technology as compared with the technology being replaced by means of the level of prices by its content is similar to the condition of the excess of the coefficient of the effectiveness of capital investments over the standard coefficient of efficiency. To determine the extent of the reduction of the expenditures per unit of increase of the effective impact it is necessary to determine how much greater the indicator of the effectiveness of capital investments should be than the standard coefficient.

To determine the necessary increase of the indicator of the effectiveness of capital investments as compared with the standard coefficient it would be possible to use the dynamics of the actual level of this indicator over a number of years. But it does not seem possible to use these data for determining the required (planned) indicator of the increase of efficiency: first, the dynamics of the change of these indicators is unstable and, second, due to the existing tendency for the estimated economic impact to be overstated.

Therefore, when determining the quantitative extent of the increase of the indicator of the efficiency of new technology we proceeded from the condition of the efficient use of new technology in the sphere of consumption and the creation for the user of an economic interest in its use. This condition can be expressed as the assurance of the planned growth rate of labor productivity (the decrease of the production cost) in the sectors which use the new technology, the guarantee of the recovery of the possible losses of the profit during the period of the assimilation of the new technology in the sphere of consumption and the planned increase of the material incentive funds. According to our calculations, for such sectors as machine tool building and metalworking the excess of the coefficient of efficiency over the standard coefficient should be 0.08-0.12.

After determining the indicator of the necessary increase of the efficiency of new technology it is possible to begin the calculation of the level of the price of the technology, which ensures the achievement of this increase, as well as the determination of the coefficient of the decrease of the expenditures per unit of effective impact.

For determining the level of the price, which ensures an indicator of efficiency in the sphere of the use of the technology of not less than E, it is possible to use the symbol of the upper limit of the price (as is done in the Method of Determining the Wholesale Prices), having substituted in place of the standard coefficient of efficiency $E_н$ the value of the indicator E. Such a substitution is possible owing to the content of the upper limit of the price, which provides the user of the technology with a standard coefficient of the effectiveness of capital expenditures. Thus, we can write the formula of the price, the level of which will provide the user of the technology with the indicator of efficiency E and thereby will correspond to the concept of the maximum or limit level--$Ц_п$.

$$\text{Ц}_{\text{п}} = \text{Ц}_{\text{б}} \frac{\text{П}_{\text{н}}}{\text{П}_{\text{б}}} \left(\frac{\frac{1}{T_{\text{б}}} + E}{\frac{1}{T_{\text{н}}} + E} \right) + \frac{\text{И}_{\text{б}} - \text{И}_{\text{н}}}{\frac{1}{T_{\text{н}}} + E} \pm \Delta K. \tag{2}$$

where $\text{Ц}_{\text{б}}$ is the price of a unit of the base (old) type of technology; $\text{П}_{\text{б}}$ and $\text{П}_{\text{н}}$ are the annual production volumes, which were produced by means of the base and new type of technology; $T_{\text{б}}$ and $T_{\text{н}}$ are the service lives respectively of the base and the new type of technology; $\text{И}_{\text{б}}$ and $\text{И}_{\text{н}}$ are the current expenses of the user on the output of the annual production volume using the base and the new type of technology in terms of the volume of the output produced by means of the new type of technology; ΔK is the change of the capital expenditures for the user in connection with the use of the new technology.

The content of the limit price, which is determined in conformity with the cited equation, can be formulated as follows: it is the level of the price of a new product, in which the increase of the consumer properties (the effective impact) as compared with the product being replaced (the base product) was reflected and the observance (nonexceeding) of which will provide when using the new product a level of efficiency, which stimulates the consumer to use it--E. In other words, for an efficiency of not less than E to be provided to the user, the level of the price should not be greater than $\text{Ц}_{\text{п}}$, that is, the limit level is the maximum permissible level from the point of view of the cost accounting interests of the user of the new product. The condition of the acceptability of the price for the new technology, or of the reduction of the expenditures per unit of increase of the effective impact (1), will assume the form:

$$\text{Ц}_2 \leq \text{Ц}_{\text{п}}. \tag{1a}$$

Thus, the coefficient of the reduction of the expenditures per unit of increase of the effective impact will be the ratio of the limit price and the upper limit of the price:

$$\left(\frac{\text{Ц}_{\text{п}}}{\text{Ц}_{\text{вп}}} = B \right).$$

We made calculations for determining the ratio of the limit price and the upper limit of the price. The coefficient of correlation (B) shows to what extent the upper limit of the price ($\text{Ц}_{\text{вп}}$) should be reduced in order to increase the efficiency of the use of the product from the standard coefficient ($E_{\text{н}}$) to the level E. The analysis of the ratio of the limit price and the upper limit of the price showed that the coefficient of correlation (B) will depend first of all on the accepted level of the indicator E, while in the case of an equal level of E--on the proportion of the amount of the saving on current costs in the upper limit of the price:

$$\left(\frac{\text{И}_{\text{б}} - \text{И}_{\text{н}}}{\text{Ц}_{\text{вп}}} \right).$$

The value of the coefficient B can fluctuate considerably, amounting at its smallest value to only half of the maximum value (from 0.5 to 1). This does not give grounds to recommend for use in practice not only the average values of the coefficient B, but in general a constant value of the coefficient, since this will not make it possible to realize the advantage of determining the limit price on the basis of the interrelationship with its level of efficiency.

The coefficient B is defined as the ratio of the limit price and the upper limit of the price. But if we use the previously calculated coefficient B and, having accepted it as a constant one, multiply it by the value of the upper limit of the price of another type of product, it may turn out that the level of the limit price in this case can be different than when determining its value (for this type of technology) according to equation (2). In other words, when using a constant average level of the coefficient B a situation might arise, in which the limit price, which is calculated by multiplying the upper limit of the price by the coefficient of the decrease ($Ц_п = Ц_{вп} \times B$), may be 25 percent less or 50 percent more than the level which its calculation according to equation (2) will give. Such fluctuations can hardly be considered permissible.

The second shortcoming of the calculation of the limit price by the method of multiplying the upper limit of the price by the constant coefficient of the decrease is the steady tendency to overstate the upper limit of the price as a result of the inclusion of too high a value of the annual saving ($И_б - И_н$). If we calculate the limit price according to equation (2), owing to the functional dependence between the total of the annual saving and the value of the limit price we eliminate the possibility of the overstatement of the limit price, since its increase occurs more slowly than the increase of the upper limit of the price. Thus, for example, with a 1.8-fold increase of the upper limit of the price (as a result of the increase of the upper limit of the price from 10 to 20 percent) the limit price will increase by only 1.65-fold, while the coefficient of the decrease may decrease by 10 points (for example, from 0.90 to 0.80).

Thus, the advantage of determining the limit price according to equation (2) consists, first, in the fact that we know beforehand the level of the coefficient of efficiency, which is being provided, and, second, in the fact that we avert the possibility of the overstatement of the limit price, which arises when calculating its level by a separate method (the calculation of the upper limit of the price separately and the use of the accepted constant coefficient B).

The limit price, which is the maximum value of the price of a new product, which ensures an increase of its efficiency in the sphere of consumption and an economic interest of the user, should not exhaust its role at the stage of designing, as usually happens now. The limit price should serve as a guideline of the limitation of the expenditures (the price) both at the stage of the assimilation of production and when approving the wholesale price. The observance (nonexceeding) of the limit price is the underlying condition of the stimulation of the producer of a new product. Stimulation by means of the price means, first of all, that a higher level of profitability (P_2) as compared with the sectorial standard profitability (P_H) should be incorporated in the price. The incentive markup on the price is the additional profit which is included in excess of the sectorial standard in the wholesale prices for new efficient types of products. By its economic content the incentive markup is a part of the economic impact, which is obtained in the sphere of use of the new technology and is redistributed in favor of the producer.

In conformity with the Method of Determining the Wholesale Prices (1974) the distribution of the impact (the determination of the incentive markup) is carried out on the basis of a scale of incentive markups, which is based on the ratio of the upper and lower limits of the prices. Here the amount of the incentive markup can be from 20 to 100 percent of the sectorial standard, but its maximum amount is limited to 50 percent of the economic impact being distributed.

The main shortcoming of the indicated scale is the fact that it does not show what proportion of the economic impact the producer receives in one case or another, to what extent the received additional profit meets the needs of his economic stimulation and what the efficiency of the use of the new product is in this case (that is, whether the approved wholesale price ensures the economic interest of the user). For the purpose of creating an equal economic advantage of a new product in the sphere of production and use we proposed a method of distributing the economic impact on the basis of the provision of the same indicator of efficiency (profitability) of the new product in production and use.

The essence of this method consists in the fact that the economic impact obtained in the sphere of use (the distributed impact) is divided between the producer and the user of the new product in proportion to the productive capital expenditures. Here the amount of the incentive markup is limited not to the standard profit, but only to that portion of the economic impact, which the producer receives. Thus, the producer and the user of a new product in the case of the implementation of the principle of equal advantage will obtain an equal level of additional profitability. The implementation of the principle of equal advantage can be achieved by using different mathematical methods. In particular, we used the correlative dependence between the amount of the possible additional profitability (the ratio of the additional profit and the production cost) and the ratio of the limits of the prices, as well as between the amount of the possible additional profitability and the ratio of the limit price and the lower limit of the price. The results of the analysis of the correlative dependence make it possible to judge the trend and the ratios of the amounts of the incentive markups for different intervals of the ratios $Ц_{вп}/Ц_{нп}$ and $Ц_{п}/Ц_{нп}$ and can be used when elaborating a scale of incentive markups for practical use.

Thus, on the basis of the calculation of the additional profitability, proceeding from the principle of the equal advantage of a new product in the sphere of production and use, we can determine what maximum amount of the additional profitability can be included in the wholesale price, having ensured here an equal coefficient of the effectiveness of the additional capital investments in the sphere of production and use. But at the same time we cannot answer the question, whether the level of the additional profitability is sufficient for the economic stimulation of the producer and whether the level of the price with the incentive markup will ensure the efficient use of the new product, that is, whether the cost accounting interests of the user are taken into account. Here it is quite clear that the question of the adequacy of the incentive markup pertains to the estimation of its level for the first intervals of the ratio. As to the subsequent intervals of the ratios, here the question arises of the expediency of limiting the possible (as a result of the distribution of the economic impact) amount of the incentive markup.

The excess (of P_2 over P_H), which makes it possible to form the incentive markup on the wholesale price, which is a part of the economic impact obtained in the sphere of the use of new technology, should be adequate for recovering a portion of the costs of assimilation and the losses of profit when assimilating the new product and for increasing the material incentive funds for the participants in the development and introduction of the new technology. Here the overall level of the price should not exceed the level acceptable to the user, which ensures an increase of efficiency in the sphere of use (2). The calculations made for a group of products of machine building showed that the excess of P_2 over P_H should be 55-58 percent of the sectorial standard of profitability, that is, $P_2 \geq (1.55\text{-}1.58)\ X\ P_H$.

In conformity with the Instructions on the Procedure of Establishing the Incentive Markups on Wholesale Prices,[3] which were approved in 1979, when determining the amount of the incentive markup the ratio of the economic impact and the wholesale price is taken as the basis. Given a ratio equal to 15 percent, the amount of the incentive markup is minimal (50 percent); given a ratio equal to 175 percent, the incentive markup comes to 125 percent of the standard profit.

A scale of incentive markups, which is constructed on the basis of the ratio of the economic impact and the wholesale price, in our opinion, has one substantial drawback. It is the fact that this ratio has quite specific limits of the quantitative values, which depend not only on the direct level of the efficiency of the new technology, but on values which are of a relatively stable nature for each sector of the use of the new technology--the structure of the production cost, the ratio of the productive capital and the capital investments. This unquestionably limits the possibility of using the developed scale. Thus, for example, the calculations made by us for the sectors of machine building and metalworking showed that the maximum value of the ratio of the economic efficiency and the wholesale price will be 36-38 percent; this will provide an incentive markup equal to 54-55 percent of the standard profit. This makes it possible to conclude that in essence only one interval of the scale of incentive markups will be used for new products which are used in the sectors of machine building and metalworking.

If we compare the amounts of the incentive markups, which were obtained in conformity with the Method of Determining the Wholesale Prices (1974) and the Instructions on the Procedure of Establishing the Incentive Markups, a clear estimate is not obtained. Here the fluctuations in the amounts of the incentive markup, which is calculated according to the new and old scales, are considerable. This could be recognized as natural and permissible with the observance of the main principle of the stimulation of the assimilation of new types of products: an incentive markup on the wholesale price of a new efficient product is stipulated and its amount depends on the level of efficiency of the new product. Here a situation arose in which an incentive markup will not be stipulated for an adequately efficient (for the producer and the user) product.

As a result of the conducted analysis it is possible to formulate the initial demands on the scale of incentive markups. This scale, which is a form of the stimulation of the producer of a new product, should be constructed so that its effect would be connected with the guarantee of the economic interest of the user. In other words, a certain level of efficiency of the new product in the sphere of use should be a condition of the stimulation of the producer, and the initial value of the scale should establish the meeting of this condition. After the meeting of this condition the principle of the equal advantage of the new product in the sphere of production and use, as well as the economic expediency of the increase of the markup should be used.

The establishment of the level of the price, which provides the user with an increase of efficiency and the receipt of an additional profit, can be considered a guarantee of the economic interest of the user of a new product. As we have already noted, the limit level is such a level of the price. That is, the approved level of the wholesale price along with the incentive markup should be less than or equal to the limit level of the price. If we take the wholesale price at the level of the limit price $(Ц_2 = Ц_п)$, it is possible to calculate what level of profitability can be provided to the user of a new product given different ratios of the upper and lower limits of the prices, as well as of the limit price and the upper limit of the price.

The analysis of the calculations made by us showed that given a ratio of the limits of the prices, which is less than the ratio of the upper limit of the price and the limit price $(Ц_{вп}/Ц_{нп}) < (Ц_{вп}/Ц_п)$, the producer cannot be provided with a standard level of profitability. Given $(Ц_{вп}/Ц_{нп}) = (Ц_{вп}/Ц_п)$, the level of profitability will be equal to the standard. Given a ratio of the limits of the prices, which is greater than the ratio of the upper limit of the price and the limit price $(Ц_{вп}/Ц_{нп}) > (Ц_{вп}/Ц_п)$, the stimulation of the producer--his provision with an incentive markup--can be accomplished. Thus, it is possible to conclude that the stimulation of the producer, that is, his provision with an incentive markup, is connected with the condition of the stimulation of the user.

The scale of the incentive markups, which is constructed according to the principle of the assurance of equal advantage, establishes the level of equal advantage, but does not show whether the degree of this advantage is adequate to the user and the producer of the technology. If we proceed on the basis that the producer can be stimulated only if the limit level of the price is not exceeded, it will turn out that the possibility of stimulation is determined by the condition when $(Ц_{вп}/Ц_{нп}) > (Ц_{вп}/Ц_п)$, or $(Ц_п/Ц_{нп}) > 1$, which can therefore be taken as the initial value of the scale of incentive markups.

We made a calculation of the possible value of the incentive markup (in the case of $Ц_2 = Ц_п = Ц_{нп} + Н_п$; $Н_п = C_2 \times P_н \times P_п$, where $P_п$ is the incentive markup in fractions of the standard profit, C_2 is the production cost of the new product, which is taken as the basis of the lower limit, $P_н$ is the sectorial standard of profitability, here the sum of the incentive markup $C_2 \times P_н \times P_п$ is equal to the difference between the limit price and the lower limit of the price $/Ц_п - Ц_{нп}/$) for different ratios of the limit price and the lower limit of the price and its comparison with the amounts of the incentive markups calculated by other methods (see Table 1).

The incentive markup of the first and in part of the second interval of the ratio, which was calculate both in conformity with the Method of Determining the Wholesale Price (1974) and by the principle of the division of the impact, is too high, while that of the subsequent interval is too low as compared with its amount, which was determined on the basis of the ratio of the limit price and the lower limit of the price. The amount of the incentive markup in conformity with the Instructions on the Procedure of Establishing the Incentive Markups is ambiguous, since its value ranges from 0 to 50 percent. Here attention should be directed to the fact that regardless of the value of the ratio of the limit price and the upper limit, the incentive markup will be identical for all equal values of the ratio of the limit price and the lower limit of the price. Thus, for example, given the ratio $(Ц_п/Ц_{нп}) = 1.08$, the incentive markup can be set in the amount of 53 percent of the sectorial standard of the profitability, while given ($Ц_{л}/Ц_{нп}$) = 1.16 it can be set in the amount of 100 percent.

Table 1

Comparative Data on Incentive Markups

Ratio of the limit price and the lower limit of the price, $Ц_{л}/Ц_{нп}$	Incentive markup, percent of the standard profit, $P_{н}$	Incentive markup calculated in conformity with:						
		Method of Determining the Wholesale Prices with a ratio of the limit price and the upper limit of the price equal to:		Instructions on Incentive Markups with a ratio of the limit price and the upper limit of the price equal to:				the principle of the division of the economic impact
		0.8	0.7	0.8		0.7		
		maximum	minimum	maximum	minimum	maximum	minimum	
1.01	6.0	20	40	--	--	51.6	0	40
1.05	33.0	30	40	50.6	0	53.2	0	40
1.08	53.0	30	50	50.6	0	53.2	0	40
1.10	65.0	30	50	50.6	0	53.2	0	40
1.16	100.0	40	50	51.6	0	55.5	0	47

The analysis of the calculations made by us made it possible to develop a scale of incentive markups. The ratio of the limit price and the lower limit of the price--($Ц_{л}/Ц_{нп}$)--is the basis for determining the incentive markup. The increase of the level of the incentive markup can occur more rapidly than in accordance with the Method of Determining the Wholesale Prices (1974). In connection with the sharper fluctuation of the level of the incentive markup its increase within the interval of the ratio, as well as the possible increase of the incentive markup after it reaches 125 percent should be envisaged (since this increase is possible and expedient with the observance of the principle of the equal advantage of a new product in the sphere of production and use). Let us cite a model scale of incentive markups, which was constructed according to the principle we proposed (see Table 2).

The wholesale price with the incentive markup, which has been determined according to the cited scale, will be less than the limit price, and this means that the efficiency of the new technology in use will be greater than the efficiency incorporated when calculating the limit price. In order for the new product to be advantageous for the producer and the user, the level of its efficiency in the sphere of use should be not less that $E_{н} \times (1.53\text{-}1.58)$, in the sphere of production--not less than $P_{н} \times (1.55\text{-}1.58)$, which corresponds to the ratio of the limit price and the lower limit of the price, which is equal to 1.20-1.22 (the third interval of ratios of the scale of incentive markups, which we elaborated).

Thus, an adequate increase of the efficiency of a new product as compared with the base product can exist when the ratio of the level of the limit price and the lower limit of the price makes it possible to determine that amount of the incentive markup, which will be equal to or greater than the additional profitability for the purposes of economic stimulation. In this case a product with ($Ц_{л}/Ц_{нп}$) $\geq$ 1.20 can be considered efficient. The making of such calculations at the stage of the development of a new product will make it possible beforehand to direct the attention of the producer to the appropriate level of the technical and economic parameters for providing an incentive markup which meets the needs for assets for the economic stimulation of the development and introduction of new technology.

Table 2

Scale of Incentive Markups on Wholesale Prices

Ratio of the limit price and the lower limit, $Ц_п/Ц_{нп}$	Amount of the incentive markup as a percentage of the standard profit	
	for achieving the minimum boundary of the interval	for each unit of increase within the interval
1.01-1.10	5	4.0
1.10-1.20	41	1.5
1.20-1.30	56	1.0
1.30-1.40	66	1.0
1.40-1.50	76	1.0
1.50-1.70	86	0.7
1.70-1.90	100	0.5
1.90-2.10	110	0.5
2.10-2.50	120	0.3
2.50 and over	132	0.1

FOOTNOTES

1. "Metodika opredeleniya optovykh tsen na novuyu produktsiyu proizvodstvenno-tekhnicheskogo naznacheniya" /The Method of Determining the Wholesale Prices for New Products for Production Engineering Purposes/, Moscow, "Preyskurantizdat", 1974.

2. L. I. Shevchenko, "Tsena i stimulirovaniye proizvodstva i primeneniya novoy tekhniki" /The Price and the Stimulation of the Production and Use of New Technology/, Kiev, "Naukova dumka", 1976, pp 58-59.

3. "Ukazaniya o poryadke ustanovleniya pooshchritel'nykh nadbavok k optovykh tsenam na novuyu vysokoeffektivnuyu produktsiyu proizvodstvennogo-tekhnicheskogo naznacheniya i skidok s optovykh tsen po produktsii vtoroy kategorii kachestva, a takzhe produktsii, kotoraya v ustanovlennyy srok ne attestovana" /Instructions on the Procedure of Establishing the Incentive Markups on the Wholesale Prices for New High Quality Products for Production Engineering Purposes and the Wholesale Price Discounts for Products of the Second Quality Category, as Well as for Products Which on the Set Date Have Not Been Certified/, Moscow, "Preyskurantizdat", 1979.

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Markup for Quality

Moscow STANDARTY I KACHESTVO in Russian No 12, Dec 80 pp 45-46

/Article by V. I. Tarasov (Institute of Economics of the Belorussian SSR Academy of Sciences): "Determination of the Level of the Markup on the Price of New High Quality Technology"/

/Text/ The economic stimulation of the increase of the quality of new technology involves at this time the establishment of an incentive markup on its price. The latter has an influence on the proportions of the distribution of the economic impact among the producers of the technology, its users and society as a whole. The amount of the markup also affects the formation of the structure and levels of the prices. However, so far there are no adequately sound proposals on the determination of the criterion and the base, with respect to which the economic impact from the increase of the quality of items should be distributed.

In the latest instructional materials, which were approved by the USSR State Committee for Prices on 27 November 1979 [1], it is ordered to establish differentiated levels of the markups subject to the ratio of the economic impact and the wholesale price. In this document the shortcomings of the previously existing procedural statutes have been eliminated to a considerable extent. Nevertheless, not all of its provisions are adequately substantiated economically.

This stems both from the logic of the construction of a scale of the additional profitability and from the used limitations with respect to the standard of the profitability. It is unclear why the excess of the economic impact over the wholesale price by 15 percent is the minimum boundary for the establishment of a markup in the amount of 50 percent of the standard profit. The attempts to present this limitation as the lower boundary of the efficiency of new technology (new tools of labor) are untenable for the reason that this violates the principle of the comparison of the saving and the expenditures, which is used in the theory of the effectiveness of capital investments. This is also confirmed by the fact that the economic impact is the result not of all the expenditures on production, which are expressed by the wholesale price, but of the additional expenditures of manpower and material resources. Consequently, when determining the level of the markup depending on the ratio of the economic impact and the wholesale price the economic effectiveness of the additional expenditures, which were required for the production of the new technology, is not taken into account.

In our opinion, the existence of a cause-effect relationship between the results and the expenditures makes it possible to solve in the following manner the problem of determining the level of the markup on the wholesale price of new high quality technology.

In order for the requirement of the comparison of the result and the expenditures to be observed when determining the amount of the markup, it is necessary to determine the economic impact from the increase of the quality and the expenditures which were required for its appearance. Here the economic impact can be defined as the difference between the upper and lower limits of the price of the new technology [2].

Since only the additional expenditures connected with the production of new tools of labor promote the appearance of the economic impact, the difference between the lower level of the price of the new technology and the price of the base technology should be taken as the expenditures which gave rise to the economic impact. The requirement to calculate the amount of the markup subject to the degree of the economic efficiency of the new technology will thereby be observed.

Since the economic impact of the tools of labor has an influence on the amount of the expenditures of the output produced (the work performed) by means of them, the minimum limit, which gives the right to establish a markup, can be determined in the following manner:

$$\frac{Э_{нх}}{П_{н}(1+E_{н})^{T}} > \frac{Ц_{нп} - Ц_{б}}{П_{н}}\,, \qquad (1)$$

where $Э_{нх}$ is the national economic impact of the increase of the quality of new technology, which is defined as the difference between the upper and lower limits of its price; $П_{н}$ is the productivity (annual output) of the new technology; $Ц_{нп}$ is the lower limit of the price of the new technology; $Ц_{б}$ is the price of the base technology (the technology being replaced); $(1+E_{н})^{T}$ is a correction factor, in which $E_{н}$ is the standard coefficient of economic efficiency, while T is the service life of the new technology up to the first overhaul, since the performance of the latter in fact means the creation of new value.

The satisfaction of inequality (1) means that in the production of a unit of output (the performance of a unit of work) by means of the new technology the saving of labor is greater than the increase of the lump-sum investments in this unit of output (work), that is, the reduction of the expenditures on the output produced (the work performed) by means of the new technology should be the criterion of the establishment of the markup on its price. The relative reduction of the cost of new tools of labor is revealed most completely precisely in this case.

On the basis of condition (1), the amount of the markup on the lower limit of the price of new high quality technology can be determined in the following manner:

$$H = \frac{Э_{нх}}{T(1+E_{н})^{T}} \leq 0.7Э_{г}^{ср}, \qquad (2)$$

where H is the markup on the lower limit of the price of new high quality technology; $Э_{г}^{ср}$ is the average annual economic impact from the increase of the quality of the new technology, which is determined in accordance with /3/.

The limitation of the level of the markup to 70 percent of the annual economic impact is in accord with the decree of the CPSU Central Committee and the USSR Council of Ministers, "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality."

The proposed method of determining the amount of the markup will be conducive to the more objective determination of its level. This follows from the fact that the level of the markup is determined subject to the amount of the economic impact for the national economy, which has been corrected by the time factor and reduced to a single year of service.

The calculations made on the basis of equation (2) for 25 models of broaching lathes showed that given a service life up to the first overhaul, which is equal to 10 years, the level of the price markup is about 25 percent of the annual economic impact. With respect to the standard of the profitability, the amount of the markup is within the range of 33 to 78 percent.

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